

tank 16. The command feed forward term, formed by the product of the  $\rho_s$  input parameter value 108 multiplied by the  $dv_s/dt$  input parameter value 106, may be considered to decouple the negative state feedback of mass flow out of the second tank 16 as discussed above with reference to Figure 5C.

The  $flow_1$  and  $flow_2$  state feedback controller with command feed forward 250, 252 may be said to provide yet another level of removal from the system parameters  $dv_{in}/dt$  and  $dm_{in}/dt$  directly associated with the states of the first and second actuators 18, 20, and provide the desired responsiveness to the parameters desired to be controlled.

It will be readily appreciated by one skilled in the art that portions of the control components described above may be combined, for example within a computer program implementing the functional blocks of the control components.

In operation, as set out in the logic flow diagram of Figure 7, the first control system 100 disclosed herein may, for example, be used to control a physical plant 10 comprising a cement slurry mixing system that provides cement slurry for cementing a tubular casing into a well bore. During such an operation, the operator may want the first control system 100 to provide a cement slurry having a desired density  $\rho_s$ , while pumping the cement slurry out of the second tank 16 at a desired volumetric flow rate  $dv_s/dt$ , and while maintaining the height of the cement slurry in the second tank 16 at a desired height  $h_2$ .

The process begins at block 400 in which the well bore servicing equipment, including the physical plant 10 and the first control system 100, is brought to the well bore site and assembled. The discharge line 32 of Figure 1 is coupled to the well bore, for example, using connected lengths of pipe, one end of which connects to a manifold or header at the well bore. Vessels containing blended dry cement and water in sufficient quantities are positioned to continuously supply the first feed line 28 and the second feed line 30 of Figure 1.

Once the equipment has been set up at the well site, the process proceeds to block 402 where an operator provides input parameter values to the controller 102, for example through a console or lap top computer coupled to the controller 102, for example via a serial cable or a wireless link. The input parameter values may include the  $h_2$  input 104, the  $dv_s/dt$  input 106, and the  $\rho_s$  input 108. In operation, the controller

102 will act to control the first and second actuators 18, 20, for example valves, such that the corresponding actual quantities of  $\rho_s$ ,  $dv_s/dt$ , and  $h_2$  approach or equal the input parameter values.

The process proceeds to block 404 where the operator engages the controller 102. The process continues hereinafter along two independent but at least partially coupled paths. Proceeding to block 406, the controller 102 actively controls the first and second actuators 18, 20 in accordance with the input parameter values and the sensed conditions of the physical plant 10. When the controller 102 is first engaged, it is likely that the first and second tanks 12, 16 will be empty. In this case, the controller 102 may open one of the first or second actuators 18, 20 fully open and then open the other of the first or the second actuators 18, 20 so as to achieve the desired cement slurry density as indicated by the  $\rho_s$  input parameter value 108. The controller 102 continually determines and updates the actuator control signals that are output to the first and second actuators 18, 20, and the controller 102 may be said to be operating within a control loop represented by blocks 406 and 408. The controller 102 remains in this control loop 406, 408 while compensating for changes of indications returned from the physical plant 10, for example the sensed density  $\rho_s$  of the cement slurry in the second tank 16 according to sensor 116, and for changes of input values, for example the  $h_2$  input parameter value 104.

The process also concurrently proceeds along a second branch to block 410 where the physical plant 10 begins to pump cement slurry via the outflow pump 22, through the discharge line 32, through the coupled pipes, and downhole into the well bore. As the flow rate  $dv_s/dt$  of the cement slurry exiting the second tank 16 via the outflow pump 22 changes, for example due to fluctuations in electrical power driving the outflow pump 22 or due to fluctuations in well bore back pressure, the controller 102 adjusts and maintains the actual physical parameters of the physical plant 10 to approach or equal the input parameter values.

The process proceeds to block 412 where the operator may modify an input parameter value, for example the  $\rho_s$  input 108. This change causes the controller 102 to change the control signals that are output to the first and second actuators 18, 20 in the control loop 406, 408, for example by further opening the first actuator 18 and further closing the second actuator 20. The coupling between this action of modifying

an input parameter value in block 412 and the control loop in blocks 406, 408 is indicated by a dotted line in Figure 7.

The process proceeds to block 414 where the operator stops the controller 102. This action in block 414 will affect the control loop in blocks 406, 408 as indicated by a dashed line in Figure 7. Specifically, stopping the controller 102 in block 414 causes the control loop in blocks 406, 408 to be exited. The process proceeds to block 416 where the physical plant 10 may be disconnected from the supply lines 28, 30 for water and dry cement, respectively, and the discharge line 32 may be disconnected from the pipes coupling the physical plant 10 to the well bore. The other equipment may be disassembled, the well bore may be closed in for a period to allow the cement to set, and the equipment of the physical plant 10 may be flushed and/or cleaned. The process exits at block 418.

In an embodiment, the indication of the height  $h_1$  of the first mixture 13 in the first tank 12, and the indication of the height  $h_2$  of the second mixture 15 in the second tank 16 are provided by two height observer components, which estimate rather than directly sense  $h_1$  and  $h_2$ . In another embodiment, a single height observer may be employed to provide an indication of the height  $h_2$  of the second mixture 15 in the second tank 16. In yet another embodiment, a single height observer may be employed to provide an indication of the height  $h_1$  of the first mixture 13 in the first tank 12, for example in a physical plant 10 having only one tank.

Under field conditions, the height indications  $h_1$ ,  $h_2$  provided by the  $h_1$  sensor 110 and the  $h_2$  sensor 112 may be subject to various errors, for example height oscillations due to movement of the physical plant 10 onboard a floating platform or ship. Additionally, the stirring action of the first stirrer 24 and second stirrer 26 may significantly agitate the level surface of the first mixture 13 in the first tank 12 and of the second mixture 15 in the second tank 16, introducing variations in the height indications  $h_1$  and  $h_2$ . The introduction of the first and second materials into the first tank 12, for example dry cement and/or water, may introduce further variations in the height indication  $h_1$  provided by the  $h_1$  sensor 110. All of these surface height variations may be analyzed as noise in the height signals. It may be desirable to employ estimated height indications of  $h_1$  and  $h_2$  rather than propagate the noise or

oscillation that may be present in the indications of direct sensors, for example the  $h_1$  sensor 110 and the  $h_2$  sensor 112, into the controller 102.

Generally, a height observer is implemented as a dynamic control system to obtain an estimated height of the mixture in the tank in real time. First, this estimate of the mixture height is compared to the measured mixture height to obtain a height error. Then this mixture height error is used to drive the estimated mixture height to an actual mixture height through the use of a proportional-integral type controller, also referred to as a PI controller. By setting the gains of the PI controller, the noise and oscillations of the mixture in the tank can be substantially removed from the mixture height estimate while tracking the actual value of the mixture height. The height observer according to the present disclosure reduces the negative effects of noise and poor sensor performance due to environmental effects such as cement dust in the air or tank oscillations from the height readings. This height observer reflects the state of the actual mixture height with substantially no time lag.

Turning now to Figure 8A, a block diagram depicts a general height observer 270. The height observer 270 includes a height PI controller component 272 and a height tank model component 274. An estimated height negative feedback term 273 is negatively summed by a fifth summation component 269 with a sensed height input 271 to determine a third error term  $e_3(t)$ . As shown in Figure 8A, the estimated height negative feedback term 273 is the same signal as the final output produced by the general height observer 270, an estimated height 277, as described herein. While the value of the estimated height negative feedback term 273 and the estimated height 277 are the same, different labels are used herein to distinguish the different functions to which the signals are applied. The estimated height negative feedback term 273 is fed back into the height observer 270 as an input, thereby creating an estimating control loop, which yields a more accurate estimated height 277 each time through. The third error term  $e_3(t)$  is processed by the height PI controller component 272 having a gain  $K_{p3}$  for a third proportional component 275 and an integral gain  $K_{i3}$  for a third integral component 276 associated with a third integration factor 278. The proportional and integral operations on the third error term  $e_3(t)$  are then positively summed by a sixth summation component 280. The temporal response of the height

PI controller component 272 to the third error term  $e_3(t)$  input, represented by the function  $u_3(t)$ , may be expressed mathematically as:

$$u_3(t) = K_{p3}e_3(t) + K_{i3}\int e_3(t)dt \quad (8)$$

The output of the height PI controller component 272 may be employed as an estimate of system errors, for example the difference between the desired and actual volumetric flow rates as well as other parameter estimations, for example the cross sectional area  $A_1$  of the first tank 12. These errors may be collected and referred to as a disturbance, where the disturbance accounts for the discrepancies between what is demanded from the first control system 100 and what the first control system 100 actually produces, unmeasured quantities such as air flows into or out of the subject tank, and inaccuracies of estimates of system parameters. When the physical plant 10 mixes dry cement, there may be differences between the desired cement rate and the actual cement rate, because the cement delivery may be inconsistent. Differences between the desired cement rate and the actual cement rate may be accommodated by the disturbance. The output of the height PI controller component 272 may be referred to as a first disturbance estimate 281. The first disturbance estimate 281 may be fed back into the controller 102 to provide disturbance decoupling. Disturbance decoupling is described in more detail hereinafter.

The output of the height PI controller component 272 (*i.e.*, the output from the sixth summation component 280) is positively summed by a seventh summation component 282 with one or more height feed forward inputs 283, for example volumetric flow rates such as the difference between the commanded volumetric flow rate  $dv_m/dt$  into the first tank 12 and the volumetric flow rate  $dv_{12}/dt$  of cement slurry out of the first tank 12 over the weir 14 into the second tank 16. The performance of the height observer 270 is expected to be improved by using height feed forward inputs 283 as compared to the performance of more traditional controllers, which only employ feedback terms with no feed forward inputs. Because the height of a mixture in a tank, for example the height  $h_1$  of the first mixture 13 in the first tank 12, will increase or decrease due to a net positive or negative volumetric flow rate into the tank, the estimate of the height of the mixture in the tank depends upon the net positive or negative volumetric flow rate into the tank: the height feed forward inputs

283. The height feed forward inputs 283 may be summed either negatively or positively at the seventh summation component 282. The output of the seventh summation component 282 conforms to a volumetric flow rate that may be represented generally as  $dv/dt$ .

The height tank model component 274 multiplies the volumetric flow rate output of the seventh summation component 282 by a fourth integral component 284 associated with a fourth integration factor 286. The fourth integral component 284 corresponds to the inverse of the cross-sectional area of the tank, represented by " $1/A$ " in the block for the fourth integral component 284. Multiplying a volumetric flow rate term ( $dv/dt$ ) by the inverse of an area term, for example the inverse of a cross-sectional tank area expressed as  $1/A$ , results in a velocity term ( $dx/dt$ ), or more particularly in the case of a height controller, an estimated height rate of change  $dh/dt$  285. The intermediate result of the estimated height rate of change  $dh/dt$  285 may be used by other components in the controller 102, for example by the flow<sub>2</sub> state feedback controller with command feed forward 252.

Integrating the velocity term via the fourth integration factor 286 results in a displacement  $x$ , or in the present case a height  $h$ . Thus, the output of the height tank model component 274 is an estimated height 277 of the mixture in the tank. One skilled in the art will recognize that the results of the analysis of the height observer 270 above may be applied to digital signals as well as analog signals. For example, analog parameters such as the sensed height input 271 may be converted by an analog-to-digital converter (A/D converter) to a digital signal. Similarly, analog outputs may be produced by a digital-to-analog converter (D/A converter), optionally combined with an amplifier to provide sufficient power to drive an electromechanical device, converting a digital control signal to an analog control signal suitable for controlling the first actuator 18 and the second actuator 20. Height observers, such as the height observer 270, are further disclosed in related U.S. Patent Application Serial No. 11/029,072, entitled "Methods and Systems for Estimating a Nominal Height or Quantity of a Fluid in a Mixing Tank While Reducing Noise," filed January 4, 2005, which is incorporated herein by reference for all purposes.

Turning now to Figure 8B, a block diagram shows a portion of one embodiment of the first control system 100 depicted in Figure 2 and Figure 6, incorporating a first

height observer 270-a and a second height observer 270-b rather than directly using the  $h_1$  sensor 110 and the  $h_2$  sensor 112. In the embodiment depicted in Figure 8B, the  $h_1$  sensor 110 provides an indication of the height  $h_1$  of the first mixture 13 in the first tank 12 to the first height observer 270-a, which is negatively summed by a ninth summation component 269-a with a first estimated height negative feedback term 273-a of the first mixture 13 in the first tank 12 to obtain an error term  $e_{3-a}(t)$  that is fed into a first height PI controller component 272-a. The output of the first height PI controller component 272-a is positively summed by a tenth summation component 282-a with a height feed forward input 283-a from an eleventh summation component 279, and the output of the tenth summation component 282-a is processed by a first height tank model component 274-a to produce an estimated height 277-a of the first mixture 13 in the first tank 12. The first proportional factor 284 (i.e.,  $1/A$ ) for the first height tank model component 274-a employs the cross-sectional area  $A_1$  of the first tank 12. The estimated height 277-a of the first mixture 13 in the first tank 12, which may be referred to as an indication of the height of the first mixture in the first tank 12, is output to the first flow regulator 202 and also to the second height observer 270-b. Note that the estimated height 277-a and the first estimated height negative feedback term 273-a are the same signals but are identified by different labels to point out their different functions in the controller 102. The output from the first height PI controller component 272-a, as a first disturbance estimate signal 281-a, optionally may be negatively summed with the output of the first flow regulator 202 by the eleventh summation component 279 to provide disturbance decoupling to the determination of the commanded volumetric flow rate  $dv_{in}/dt$  of material into the first tank 12. In another embodiment, disturbance decoupling is provided by a second disturbance estimate signal 281-b that is negatively summed with the output of the first flow regulator 202 by the eleventh summation component 279. The second disturbance estimate signal 281-b is determined by the second height observer 270-b, as discussed in more detail below. The commanded volumetric flow rate  $dv_{in}/dt$  output by the eleventh summation component 279 is the commanded first volume flow rate  $dv_{in}/dt$  signal 151 to the flow modulator 150 or to the first and second flow modulators 152, 154 as described above with reference to Figure 3.

The  $h_2$  sensor 112 provides an indication of the height  $h_2$  of the second mixture 15 in the second tank 16 to the second height observer 270-b, which is negatively summed by a twelfth summation component 269-b with a second estimated height negative feedback term 273-b of the second mixture 15 in the second tank 16 to obtain an error term  $e_{3-b}(t)$  that is fed into a second height PI controller component 272-b. The output of the second height PI controller component 272-b is positively summed by a thirteenth summation component 282-b with a second height feed forward input 283-b output by a first calculation component 268. The first calculation component 268 outputs the result of the function  $F(h_1)$  based on the estimated height 277-a of the first mixture 13 in the first tank 12. In an embodiment, the value of  $F(h_1)$  is calculated by the first flow regulator 202 and provided to the thirteenth summation component 282-b as the second height feed forward input 283-b. In this embodiment, the first calculation component 268 is not employed. The output of the thirteenth summation component 282-b is then processed by a second height tank model component 274-b to produce a second estimated height 277-b of the second mixture 15 in the second tank 16. The first proportional factor 284 (i.e.,  $1/A$ ) for the second height tank model component 274-b employs the cross-sectional area  $A_2$  of the second tank 16. Note that the second estimated height 277-b and the second estimated height negative feedback term 273-b are the same signals but are identified by different labels to point out their different functions in the controller 102.

Within the second height observer 270-b, the output from the second height PI controller component 272-b provides the second disturbance estimate signal 281-b that is negatively summed by the eleventh summation component 279, as previously discussed. In an embodiment, the second disturbance estimate signal 281-b may provide a more accurate estimate of the volumetric rate disturbance in the system 100 as compared to the first disturbance estimate signal 281-a because the height of the second mixture 15 in the second tank 16 varies more than the height of the first mixture 13 in the first tank 12. Additionally, in the two tank system of Figure 1, the surface of the first mixture 13 in the first tank 12 may not be level but may slope downwardly from the point where the actuators 18, 20 dispense the materials to the weir 14. The second estimated height 277-b of the second mixture 15 in the second tank 16, which may be referred to as an indication of the height  $h_2$  of the second

mixture 15 in the second tank 16, is fed into the flow<sub>1</sub> state feedback controller with command feed forward 250 as an input, and the control process is repeated. The estimated height rate of change  $dh/dt$  277 of the second height observer 270-b,  $dh_2/dt$ , is used for state feedback decoupling by the flow<sub>2</sub> state feedback controller with command feed forward 252.

The advantages of the height observer 270, such as, for example, attenuation of noise and improvement of poor sensor performance, estimation of a disturbance term, and estimation of a parameter rate of change, may be obtained in a density observer having a structure related to the height observer 270. In an embodiment, the indication of the density  $\rho_{12}$  of the first mixture 13 in the first tank 12 and the indication of the density  $\rho_s$  of the second mixture 15 in the second tank 16 are provided by two density observer components which estimate rather than directly sense the densities  $\rho_{12}$ ,  $\rho_s$  of the mixtures 13, 15, respectively. In another embodiment, the density observer may be used to estimate the density of other mixtures or materials in systems other than the physical plant 10 depicted in Figure 1.

Turning now to Figure 9A, a general density observer 290 operable to determine an estimated density of a mixture in a tank is depicted. The density observer 290 includes a density PI controller component 292 and a density tank model component 294. An eighth summation component 299 negatively sums an estimated density negative feedback term 295 with a sensed density input 291 to determine a fourth error term  $e_4(t)$ . The fourth error term  $e_4(t)$  is processed by the density PI controller component 292, which has a gain  $K_{p4}$  for a fourth proportional component 296 and an integral gain  $K_{i4}$  for a fifth integral component 298 associated with a fifth integration factor 300. In an embodiment, the fourth error term  $e_4(t)$  may be processed by a filter instead of by the density PI controller component 292, such as an analog filter or a digital filter, to introduce desirable time lags or to attenuate and/or amplify certain frequency components of the fourth error term  $e_4(t)$ .

The output of the density PI controller component 292 may be employed as an estimate of system errors, for example the difference between the desired and actual mass flow rates as well as other parameter estimations. These errors may be collected and referred to as a disturbance, where the disturbance accounts for the discrepancies between what is demanded from the first control system 100 and what

the first control system 100 actually produces, unmeasured quantities such as air flows into or out of the subject tank, and inaccuracies of estimates of system parameters. The output of the density PI controller component 292 may be referred to as a second disturbance estimate 301. The second disturbance estimate 301 may be fed back into the controller 102 to provide disturbance decoupling. Disturbance decoupling is described in more detail hereinafter.

The output of the density PI controller component 292, which conforms to a mass flow rate, is summed with one or more density feed forward inputs 293, for example a mass flow rate, such as the difference between the commanded mass flow rate into the first tank 12 and the mass flow rate of cement slurry out of the first tank 12 over the weir 14 into the second tank 16, by a third summation component 302. The output of a twelfth multiplication component 435 and the output of a thirteenth multiplication component 440 are also negatively summed by the third summation component 302. Generally, the density feed forward inputs 293 are associated with mass flow into the associated tank and the outputs of the twelfth and thirteenth multiplication components 435, 440 are associated with mass flow out of the associated tank. The output of the third summation component 302 is processed by the density tank model component 294. The density tank model component 294 multiplies the output of the third summation component 302 by a sixth integral component 304 associated with a sixth integration factor 306. The sixth integral component 304 is inversely proportional to the height of the mixture times the cross-sectional area of the tank, as represented by " $1/hA$ " in the block for the sixth integral component 304. Note that dividing a mass flow rate by  $hA$  is substantially equivalent to dividing through by the volume of the tank resulting in an estimated density rate of change 307  $dp/dt$ . The height may be provided by a height sensor, for example the  $h_1$  sensor 110, or the height observer 270. Alternatively, the height may be a fixed constant determined by experimentation to provide a preferred response rate of the general density observer 290. Integrating this quotient with respect to time results in a density. The output of the density tank model component 294 is thus the estimated density 297 of the mixture in the tank. The estimated density negative feedback term 295 is the same signal as the estimated density 297, but the estimated density feedback term 295 is fed back into the eighth summation component 299 at the input

to the density observer 290 to be processed through the PI controller 292 and tank model component 294 to yield a more accurate estimated density 297 each time through. The estimated density negative feedback term 295 is multiplied by a factor  $A(dh/dt)$  by the twelfth multiplication component 435 to produce a  $\rho A(dh/dt)$  term that is negatively fed back to the third summation component 302 as described above. The  $\rho A(dh/dt)$  term corresponds to a mass rate of change based on changes in the height of the mixture in the tank. The  $dh/dt$  factor may be determined from a height sensor or a height observer. Alternatively, in an embodiment of the system 100 that provides no indication or estimate of height of the mixture, the twelfth multiplication component 435 may be absent from the general density observer 290. The estimated density negative feedback term 295 is also multiplied by a factor  $dv/dt$  by the thirteenth multiplier component 440 to produce a  $\rho(dv/dt)$  term that is negatively fed back to the third summation component 302 as described above. The  $\rho(dv/dt)$  term corresponds to a mass rate of change due to flow of the mixture out of the tank. In an embodiment, the sensed density input 291 may be provided by a density sensor, for example the  $P_{12}$  sensor 114, installed in a recirculation line or an outflow line, such as the discharge line 32, associated with the tank. Thus, the density of the mixture as measured in the recirculation line may lag several seconds behind the density of the mixture in the tank. In this embodiment, a time delay of several seconds, such as three seconds, for example, may be introduced in the estimated density negative feedback term 295 before negatively summing with the sensed density 291 at the eighth summation component 299 to determine the fourth error term  $e_4(t)$ . This allows the sensed and estimated density to be in the same time reference frame before determining the fourth error term  $e_4(t)$ . The appropriate time delay may be readily determined from experimentation by one skilled in the art and depends upon the viscosity of the mixture and the speed of mixing.

Because the structures of the height observer 270 and the density observer 290 are related, one skilled in the art need only determine the gains appropriate to the height observer 270, determine the gains appropriate to the density observer 290, and configure the two observer structures 270, 290 accordingly. One skilled in the art will recognize that the results of the analysis of the density observer 290 above may be applied to digital signals as well as analog signals. For example, analog parameters

such as the indication of density  $\rho_s$  of the second mixture 15 in the second tank 16 from the  $\rho_s$  sensor 116 may be converted by an analog-to-digital converter (A/D converter) to a digital signal. Similarly, analog outputs may be produced by a digital-to-analog converter (D/A converter), optionally combined with an amplifier to provide sufficient power to drive an electromechanical device, converting a digital control signal to an analog control signal suitable for controlling the first actuator 18 and the second actuator 20.

Turning now to Figure 9B, a block diagram shows a portion of one embodiment of the first control system 100 incorporating a first density observer 290-a and a second density observer 290-b. The  $\rho_{12}$  sensor 114 provides an indication of the density  $\rho_{12}$  of the first mixture 13 in the first tank 12 to the first density observer 290-a, which is negatively summed by a fourteenth summation component 299-a with a first estimated density negative feedback term 295-a of the first mixture 13 in the first tank 12 to obtain an error term  $e_{4-a}(t)$ . As described above, in an embodiment where the  $\rho_{12}$  sensor 114 is located in a recirculation line, the estimated density negative feedback term 295-a may be delayed several seconds before it is input to the fourteenth summation component 299-a. The  $e_{4-a}(t)$  error term is fed into a first density PI controller component 292-a. The output of the first density PI controller component 292-a is positively summed with a first density feed forward input 293-a from a seventeenth summation component 305 by a fifteenth summation component 302-a. The output of a fourteenth multiplication component 435-a and a fifteenth multiplication component 440-a, corresponding to a mass rate of change due to changes in height in the first tank 12 and the mass flow rate out of the first tank 12, respectively, are negatively summed by the fifteenth summation component 302-a. The sum output by the fifteenth summation component 302-a is processed by a first density tank model component 294-a. Note that the sixth integral component 304 of the first density tank model component 294-a employs the cross sectional area  $A_1$  of the first tank 12 and the height  $h_1$  of the first mixture 13 in the first tank 12. Note that the first estimated density negative feedback term 295-a and a first estimated density 297-a are the same signals but are identified by different labels to point out their different functions in the controller 102.

The output from the first density PI controller component 292-a, as the second disturbance estimate 301, is negatively summed by the seventeenth summation component 305 with the output from the second flow regulator 204 plus the output generated by a fifth multiplier component 321 to determine the commanded mass flow rate  $dm_{12}/dt$  signal 203. The second disturbance estimate 301 provides disturbance decoupling to the determination of the commanded mass flow rate  $dm_{12}/dt$  signal 203, while the fifth multiplier component 321 provides state feedback decoupling. The fifth multiplier component 321 outputs the product formed by multiplying the first estimated density 297-a of the first mixture 13 in the first tank 12 by the height rate of change  $dh_1/dt$  of the first mixture 13 in the first tank 12 and by the area  $A_1$  of the first tank 12, obtaining the height rate of change  $dh_1/dt$ , for example, from the estimated height rate of change 285 output of the first height observer 270a. In another embodiment, the second disturbance estimate 301 may be provided by the second density observer 290-b.

To estimate the density  $\rho_s$  of the second mixture 15, the  $\rho_s$  sensor 116 provides an indication of the density  $\rho_s$  of the second mixture 15 in the second tank 16 to the second density observer 290-b. This indication of  $\rho_s$  is summed by an eighteenth summation component 299-b with a second estimated density negative feedback 295-b of the second mixture 15 in the second tank 16 to obtain an error term  $e_{4-b}(t)$ . As described above, in an embodiment where the  $\rho_s$  sensor 116 is located in a recirculation line or in an outflow line, such as the discharge line 32, the estimated density negative feedback term 295-b may be delayed several seconds before it is input to the eighteenth summation component 299-b. The error term  $e_{4-b}(t)$  is fed into a second density PI controller component 292-b. A second density feed forward input 293-b, output by a sixth multiplier component 322, is positively summed by a nineteenth summation component 302-b with the output of the second density PI controller component 292-b. The sixth multiplier component 322 outputs the product formed by multiplying the first estimated density 297-a of the first mixture 13 in the first tank 12 by the volumetric flow rate  $dv_{12}/dt$  of the first mixture 13 into the second tank 16. The output of a sixteenth multiplication component 435-b and a seventeenth multiplication component 440-b, corresponding to a mass rate of change due to changes in height in the second tank 16 and mass flow rate out of the second tank 16,

respectively, are negatively summed by the nineteenth summation component 302-b. The output of the nineteenth summation component 302-b is processed by a second density tank model component 294-b. Note that the sixth integral component 304 for the second density tank model component 294-b employs the cross sectional area  $A_2$  of the second tank 16 and the height  $h_2$  of the second mixture 15 in the second tank 16. The second estimated density 297-b of the second mixture 15 in the second tank 16 is provided as an input to the flow<sub>2</sub> state feedback controller with command feed forward 252 for use in generating the commanded mass flow rate  $dm_{12}/dt$ , which is the commanded mass flow rate  $dm_{12}/dt$  signal 203 provided as a commanded parameter value to the second flow regulator 204 as described above with reference to Figure 4. Note that the second estimated density negative feedback term 295-b and the second estimated density 297-b are the same signals but are identified by different labels to point out their different functions in the controller 102.

One skilled in the art will readily appreciate that the components of the first control system 100 disclosed above are susceptible to many alternate embodiments. While several alternate embodiments are disclosed hereinafter, other embodiments are contemplated by the present disclosure.

Turning now to Figure 10A, a portion of a second control system 364 is depicted. The second control system 364 controls a physical plant 10 having a single tank, such as the first tank 12 of Figure 1, and first and second actuators 18, 20. The second control system 364 uses a height observer 270, which is substantially similar to that described above with respect to Figure 8A, to estimate the height of the first mixture 13 in the first tank 12 and to determine the first disturbance estimate 281.

Several components are combined to provide a first height controller 366 that is substantially similar to the flow<sub>1</sub> state feedback controller with command feed forward 250 described above with reference to Figure 5B. Specifically, an eighteenth summation component 346 determines a fifth error term  $e_5(t)$  by negatively summing the estimated height 277 produced by the height observer 270 with an  $h_1$  input 340, provided for example by an operator. The fifth error term  $e_5(t)$  is processed by a proportional gain term  $N_p$  in a seventh multiplication component 344. A thirtieth summation component 426 sums the output of the seventh multiplication component 344 positively with the  $dv_9/dt$  input 106 that provides command feed forward. A

twenty-eighth summation component 422 negatively sums the first disturbance estimate 281 with the output of the thirtieth summation component 426. The twenty-eighth summation component 422 provides the same function as the flow<sub>1</sub> regulator 202 as described above with reference to Figure 8B. The output of the twenty-eighth summation component 422 is the commanded first volume flow rate  $dv_{in}/dt$  signal 151 that is fed to the first and second flow modulators 152, 154 and into the seventh summation component 282 of the height observer 270 as the volume feed forward inputs 283. A first  $dv_s/dt$  term 445 is fed negatively into the seventh summation component 282, and the first  $dv_s/dt$  term 445 may be obtained either from a flow sensor or may be based on the  $dv_s/dt$  input 106. The first flow modulator 152 controls the first actuator 18 based on the commanded first volume flow rate  $dv_{in}/dt$  signal 151 and the commanded first mass flow rate  $dm_{in}/dt$  signal 153, which is generated as described below with reference to Figure 10B.

Turning now to Figure 10B, another portion of the second control system 364 is depicted. Several components are combined to provide a first density controller 368 that is substantially similar to the flow<sub>2</sub> state feedback controller with command feed forward 252 described above with reference to Figure 5C, with the exception that the  $(dh_2/dt)A_2$  term associated with the first multiplication component 266 is omitted, because there is no second tank 16 in this embodiment. A twentieth summation component 350 determines a sixth error term  $e_6(t)$  by negatively summing the density estimate 297 produced by the modified density observer 356 with the input  $\rho_s$  108. The sixth error term  $e_6(t)$  is processed by a proportional gain term  $K_m$  in a ninth multiplication component 352. A tenth multiplication component 360 multiplies the density estimate 297 by the  $dv_s/dt$  input 106. The second disturbance estimate 362 is negatively summed with the outputs of the ninth and tenth multiplication components 352, 360 by a twenty-ninth summation component 424. The output of the tenth multiplication component 360 may be considered to provide command feed forward to a density controller 368 that comprises the twentieth summation component 350, the ninth multiplication component 352, the tenth multiplication component 360, and the twenty-ninth summation component 424. The output of the twenty-ninth summation component 424 is the commanded first mass flow rate  $dm_{in}/dt$  signal 153 that is fed into the first and second flow modulators 152, 154 and into the density observer 290

as the density feed forward inputs 293. The second flow modulator 154 controls the second actuator 20 based on the commanded first volume flow rate  $dv_{in}/dt$  signal 151 and the commanded first mass flow rate  $dm_{in}/dt$  signal 153, which is generated as described above with reference to Figure 10A.

One of ordinary skill in the art will readily appreciate that no integral processing is employed in the first height controller 366 described above with reference to Figure 10A or in the density controller 368 because the effect of command feed forward and disturbance decoupling is to reduce steady-state error to substantially zero, thereby transforming the second control system 364 from a first order non-linear system (as in the first control system 100), to a first order linear system that may be controlled by proportional controllers. In general, if the disturbances are decoupled or removed using the observers, for example by the height observer 270 and/or the density observer 290, and the command feed forward terms, then a proportional (P) controller may be used with substantially zero steady state error, since the second control system 364 will behave in accordance with a linear first order differential equation. If the disturbances are not decoupled, it may be preferable to use a PI controller, so that the integral term acts to ensure substantially zero steady state error.

Turning now to Figure 11, a third control system 376 is depicted. The third control system 376 controls a physical plant 10 having two actuators 18, 20; two tanks 12, 16; and only a single sensor, the  $p_{12}$  sensor 114, measuring the density  $p_{12}$  of the first mixture 13 in the first tank 12. In this embodiment, the commanded first volume flow rate  $dv_{in}/dt$  signal 151 to the first and second flow modulators 152, 154 is provided directly by the  $dv_s/dt$  input 106 without employing a flow regulator or other components as in the first control system 100. Also, this embodiment contains no height controller, so an operator may adjust the actual volumetric flow rate  $dv_s/dt$  out of the second tank 16 by controlling the outflow pump 22, and thereby maintain the desired height  $h_2$  of the second mixture 15 in the second tank 16.

The density observer 290 determines the density estimate 297 of the density  $p_{12}$  of the first mixture 13 in the first tank 12 and the second disturbance estimate 362 based on the output of the  $p_{12}$  sensor 114 and density feed forward inputs 293. Because this embodiment provides no indication of height, the  $A(dh/dt)$  term in Figure 9A that is associated with the twelfth multiplier component 435 is omitted. As described above

with reference to Figure 9A, in the present embodiment the height component of the sixteenth integral component 304 is a constant value chosen to provide a desirable system response time. A twenty-second summation component 380 negatively sums the density estimate 297 with a  $\rho_{12}$  input parameter value 370 to determine a seventh error term  $e_7(t)$ , which is multiplied by a proportional gain  $K_m$  by an eleventh multiplication component 382. The  $\rho_{12}$  input 370, for example, may be provided by an operator through an interface. The twenty-second summation component 380 and the eleventh multiplication component 382 comprise a second density controller 372 that controls the density  $\rho_{12}$  of the first mixture 13 in the first tank 12. In steady state conditions, the density of the second mixture 15 in the second tank 16 will follow the controlled density  $\rho_{12}$  of the first mixture 13 in the first tank 12. When the  $\rho_{12}$  input 370 is changed, the density  $\rho_s$  of the second mixture 15 in the second tank 16 will substantially equal the density  $\rho_{12}$  of the first mixture 13 in the first tank 12 after a time lag.

A twelfth multiplication component 384 multiplies the density estimate 297 by the approximate actual volumetric flow  $dv_{12}/dt$ . Because  $h_1$  is not measured, and the function  $F(h_1)$  may not be used, the  $dv_s/dt$  input 106 is used to approximate the actual volumetric flow  $dv_{12}/dt$  over the weir 14. The output of the twelfth multiplication component 384 provides state feedback decoupling to the control system 376 to compensate for mass leaving the first tank 12.

The second disturbance estimate 362 is negatively summed with the output of the eleventh and twelfth multiplication components 382, 384 by a twenty-first summation component 374 to determine the commanded first mass flow rate  $dm_m/dt$  signal 153. The commanded first mass flow rate  $dm_m/dt$  signal 153 is provided to the first and second flow modulators 152, 154 to control the first and second actuators 18, 20 as described above. The output of the twenty-first summation component 374 also provides the density feed forward inputs 293 to the density observer 290.

Turning now to Figure 12, a fourth control system 378 is depicted. The fourth control system 378 is substantially similar to the third control system 376, with the exception that the fourth control system 378 includes the height observer 270 and a second height controller 428. The height observer 270 determines the estimated height 277 of the second mixture 15 in the second tank 16 based on input from the  $h_2$

sensor 112 and the height feed forward inputs 283. A second  $dv_s/dt$  factor 450 is negatively summed with the height feed forward inputs 283 and the output of the height PI controller 272 by the seventh summation component 282. The estimated height 277 is negatively summed with the  $h_2$  input 104 by a twenty-third summation component 386 to generate an eighth error term  $e_8(t)$ . The eighth error term  $e_8(t)$  is processed by a third PI controller 390 to produce a commanded height signal 430, which is summed with the  $dv_s/dt$  input 106 by a twenty-fourth summation component 388 to produce the  $dv_{in}/dt$  signal 151 provided to the flow modulators 152, 154. Based on the  $dv_{in}/dt$  signal 151 and the  $dm_{in}/dt$  signal 153, the first and second flow modulators 152, 154 control the states of the first and second actuators 18, 20 as described above.

While the physical plant 10 controlled by the several embodiments of the control systems 100, 364, 376, and 378 described above included either one or two tanks, in other embodiments the control systems may control mixing parameters of more than two tanks connected in series. In other embodiments, one or more sensors may be employed selected from the  $p_{12}$  sensor 114, the  $p_s$  sensor 116, the  $h_1$  sensor 110, the  $h_2$  sensor 112, and a flow rate sensor. Embodiments may use a mixture of sensors with no height observer 270 or density observer 290. Other embodiments may use one or more sensors with one or more height observers 270 and/or density observers 290. While the height observer 270 and the density observer 290 are discussed above, the observer concept may be extended to other sensors to reduce noise output from these and other sensors and to obtain the benefits associated with decoupling or removing disturbances and estimating intermediate rate terms. One skilled in the art will readily appreciate that coupling among control components may be altered to simplify processing, as for example combining two summation components in series by directing all the inputs to the two summation components to a single summation component or by replacing two components that calculate the same value by one component and routing the output of the one component to two destinations. Alternately, in an embodiment, a summation component summing more than two inputs may be expanded into a series of two or more summation components that collectively sum the several inputs.

The controller 102 used in the various control systems 100, 364, 376, and 378 described above may be implemented on any general-purpose computer with sufficient processing power, memory resources, and network throughput capability to handle the necessary workload placed upon it. Figure 13 illustrates a typical, general-purpose computer system 580 suitable for implementing one or more embodiments of the several control system embodiments disclosed herein. The computer system 580 includes a processor 582 (which may be referred to as a central processor unit or CPU) in communication with memory devices including secondary storage 584, read only memory (ROM) 586, random access memory (RAM) 588, input/output (I/O) 590 devices, and network connectivity devices 592. The processor may be implemented as one or more CPU chips. The commands or signals output to the first actuator 18 and the second actuator 20 may be converted from a digital to an analog signal by a digital to analog converter (DAC), not shown, or otherwise conditioned to make the actuator signal conformable to a control input to the first actuator 18 and a control input to the second actuator 20.

The secondary storage 584 typically comprises one or more disk drives or tape drives and is used for non-volatile storage of data and as an over-flow data storage device if RAM 588 is not large enough to hold all working data. Secondary storage 584 may be used to store programs that are loaded into RAM 588 when such programs are selected for execution. The ROM 586 is used to store instructions and perhaps data that are read during program execution. ROM 586 is a non-volatile memory device which typically has a small memory capacity relative to the larger memory capacity of secondary storage 584. The RAM 588 is used to store volatile data and perhaps to store instructions. Access to both ROM 586 and RAM 588 is typically faster than to secondary storage 584.

I/O devices 590 may include printers, video monitors, liquid crystal displays (LCDs), touch screen displays, keyboards, keypads, switches, dials, mice, track balls, voice recognizers, card readers, paper tape readers, or other well-known input devices. The network connectivity devices 592 may take the form of modems, modem banks, ethernet cards, universal serial bus (USB) interface cards, serial interfaces, token ring cards, fiber distributed data interface (FDDI) cards, wireless local area network (WLAN) cards, radio transceiver cards such as Global System for Mobile

Communications (GSM) radio transceiver cards, and other well-known network devices. These network connectivity devices 592 may enable the CPU 582 to communicate with an Internet or one or more intranets. With such a network connection, it is contemplated that the CPU 582 might receive information from the network, or might output information to the network in the course of performing the above-described method steps. Such information, which is often represented as a sequence of instructions to be executed using processor 582, may be received from and outputted to the network, for example, in the form of a computer data signal embodied in a carrier wave.

Such information, which may include data or instructions to be executed using processor 582 for example, may be received from and outputted to the network, for example, in the form of a computer data baseband signal or signal embodied in a carrier wave. The baseband signal or signal embodied in the carrier wave generated by the network connectivity devices 592 may propagate in or on the surface of electrical conductors, in coaxial cables, in waveguides, in optical media, for example optical fiber, or in the air or free space. The information contained in the baseband signal or signal embedded in the carrier wave may be ordered according to different sequences, as may be desirable for either processing or generating the information or transmitting or receiving the information. The baseband signal or signal embedded in the carrier wave, or other types of signals currently used or hereafter developed, referred to herein as the transmission medium, may be generated according to several methods well known to one skilled in the art.

The processor 582 executes instructions, codes, computer programs, scripts which it accesses from hard disk, floppy disk, optical disk (these various disk based systems may all be considered secondary storage 584), ROM 586, RAM 588, or the network connectivity devices 592.

While several embodiments have been provided in the present disclosure, it should be understood that the disclosed systems and methods may be embodied in many other specific forms without departing from the spirit or scope of the present disclosure. The present examples are to be considered as illustrative and not restrictive, and the intention is not to be limited to the details given herein, but may be modified within the scope of the appended claims along with their full scope of

equivalents. For example, the various elements or components may be combined or integrated in another system or certain features may be omitted, or not implemented.

Also, techniques, systems, subsystems and methods described and illustrated in the various embodiments as discrete or separate may be combined or integrated with other systems, modules, techniques, or methods without departing from the scope of the present disclosure. Other items shown or discussed as directly coupled or communicating with each other may be coupled through some interface or device, such that the items may no longer be considered directly coupled to each other but may still be indirectly coupled and in communication, whether electrically, mechanically, or otherwise with one another. Other examples of changes, substitutions, and alterations are ascertainable by one skilled in the art and could be made without departing from the spirit and scope disclosed herein.

What is claimed is:

1. A control system for mixing at least two materials in a physical system having two or more tanks, comprising:
  - at least two actuators, each actuator being operable to introduce a material into a first tank to form a first mixture, the first mixture flowing into a second tank to form a second mixture; and
  - a controller operable, based on a commanded input, to control the at least two actuators to obtain a density of either the first mixture or the second mixture and a volume flow rate of the second mixture out of the second tank; wherein the density is controlled independently from the volume flow rate.
2. The control system of Claim 1, wherein the actuators are selected from the group consisting of valves, screw feeders, augurs, and elevators.
3. The control system of Claim 1, wherein the materials are selected from the group consisting of water, carrier fluid, dry cement material, sand, and proppants.
4. The control system of Claim 1 wherein the commanded input comprises:
  - a commanded combined volume flow rate of the materials passing through the actuators into the first tank [commanded  $dv_{in}/dt$ ]; and
  - a commanded combined mass flow rate of the materials passing through the actuators into the first tank [commanded  $dm_{in}/dt$ ].
5. The control system of Claim 4, wherein a first actuator is controlled by a first signal based on a function  $f_1$  where:
 
$$f_1 = [\text{commanded } dm_{in}/dt - (\text{commanded } dv_{in}/dt) \times \rho_{m2}] / (\rho_{m1} - \rho_{m2})$$
 wherein:  $\rho_{m1}$  = density of a first material; and  
 $\rho_{m2}$  = density of a second material.
6. The control system of Claim 4, wherein a second actuator is controlled by a second signal based on a function  $f_2$  where:
 
$$f_2 = [(\text{commanded } dv_{in}/dt) \times \rho_{m1} - \text{commanded } dm_{in}/dt] / (\rho_{m1} - \rho_{m2})$$
 wherein:  $\rho_{m1}$  = density of a first material; and  
 $\rho_{m2}$  = density of a second material.
7. The control system of Claim 4, wherein the commanded  $dv_{in}/dt$  is based, at least in part, on a volumetric flow rate command feed forward input [ $dv_{in}/dt$  input] and the

commanded  $dm_{in}/dt$  is based, at least in part, on a first indication of density of the first mixture and a first commanded density of the first mixture or the second mixture.

8. The control system of Claim 7, wherein the commanded  $dv_{in}/dt$  is further based, at least in part, on an indication of height of the second mixture in the second tank and an operator input height of the second mixture.

9. The control system of Claim 7, wherein the commanded  $dv_{in}/dt$  is further based, at least in part, on the quantity:

$$F(h)(1-K_v) + K_v(\text{commanded } dv_{12}/dt)$$

wherein:  $K_v$  = a first constant of proportionality;

$F(h)$  = a non-linear function of a height of the first mixture in the first tank;

and

commanded  $dv_{12}/dt$  = a commanded volume flow rate of the first mixture flowing from the first tank into the second tank.

10. The control system of Claim 10, wherein the commanded  $dv_{12}/dt$  is based on:

a first error term determined by subtracting an indication of a height of the second mixture in the second tank from an operator input desired height of the second mixture in the second tank [ $h_2$  input]; and

an operator input desired volume flow rate of the second mixture out of the second tank [ $dv_s/dt$  input].

11. The control system of Claim 10, wherein the first error term is processed by either a first proportional integral controller component or a first proportional controller component.

12. The control system of Claim 7, wherein the commanded  $dv_{in}/dt$  is further based, at least in part, on a volumetric disturbance estimate.

13. The control system of Claim 7, wherein the commanded  $dm_{in}/dt$  is further based, at least in part, on the quantity:

$$F(h)(\rho_{12})(1-K_m) + K_m(\text{commanded } dm_{12}/dt);$$

wherein:  $K_m$  = a second constant of proportionality;

$F(h)$  = a non-linear function of a height of the first mixture in the first tank;

commanded  $dm_{12}/dt$  = a commanded mass flow rate of the first mixture flowing from the first tank into the second tank; and

$\rho_{12}$  = an indication of the density of the first mixture in the first tank.

14. The control system of Claim 13, wherein the commanded  $dm_{12}/dt$  is based on a second error term determined by subtracting the first indication of density from the first commanded density.
15. The control system of Claim 13, wherein the commanded  $dm_{12}/dt$  is based on a second error term determined by subtracting a second indication of density of the second mixture from the first commanded density of the second mixture.
16. The control system of Claim 15, wherein the second error term is processed by either a second proportional integral controller component or a second proportional controller component.
17. The control system of Claim 15, wherein the commanded  $dm_{12}/dt$  is further based on a parameter selected from the group consisting of:
  - an operator input desired volume flow rate of the second mixture out of the second tank [ $dv_s/dt$  input]; and
  - an indication of a height rate of change of the second mixture in the second tank.
18. The control system of Claim 7, wherein the commanded  $dm_{in}/dt$  is further based, at least in part, on a mass disturbance estimate.
19. The control system of Claim 7, wherein the commanded  $dv_{in}/dt$  is further based, at least in part, on an indication of height of the first mixture in the first tank and a commanded height of the first mixture in the first tank.
20. The control system of Claim 19, further comprising:
  - a first height sensor operable to produce a first sensed height output of the first mixture in the first tank; and
  - a first height observer operable to provide the indication of height of the first mixture in the first tank based on the first sensed height output, the commanded height, and a commanded volumetric flow rate.
21. The control system of Claim 20, wherein the first height observer is further operable to provide a first disturbance estimate.
22. The control system of Claim 20, further comprising:
  - a second height sensor operable to produce a second sensed height output of the second mixture in the second tank; and

- a second height observer operable to provide an indication of height of the second mixture in the second tank based on the second sensed height output and on the indication of height of the first mixture in the first tank.
23. The control system of Claim 22, wherein the second height observer is further operable to provide the first disturbance estimate.
24. The control system of Claim 7, further comprising:
- a first density sensor operable to produce a first sensed density output of the first mixture in the first tank; and
  - a first density observer operable to provide the indication of density of the first mixture in the first tank based on the first sensed density output, the first commanded density of the first mixture, and a mass flow rate.
25. The control system of Claim 24, wherein the first density observer comprises:
- a third proportional integral controller responsive to a third error term determined as the sensed density output minus the first indication of density of the first mixture in the first tank; and
  - a tank model having an integrating component and a gain component, the gain component inversely proportional to the area of the first tank and to the height of the first mixture in the first tank, the tank model responsive to the output of the third proportional integral controller.
26. The control system of Claim 25, wherein the first indication of density is delayed before determining the third error term.
27. The control system of Claim 24, wherein the first density observer is further operable to provide a second disturbance estimate.
28. The control system of Claim 24, further comprising:
- a second density sensor operable to produce a second sensed density output of the second mixture in the second tank; and
  - a second density observer operable to provide an indication of the density of the second mixture in the second tank based on the second sensed density output and the indication of density of the first mixture in the first tank.
29. The control system of Claim 28, wherein the second density observer is further operable to provide the second disturbance estimate.

30. A control system for mixing at least two materials in a tank, comprising:  
 at least two actuators, each actuator being operable to introduce a material into the tank to form a mixture; and  
 a controller operable, based on a commanded input, to control the at least two actuators to obtain a density of the mixture and a volume flow rate of the mixture out of the tank;  
 wherein the density is controlled independently from the volume flow rate.
31. The control system of Claim 30, wherein the commanded input comprises:  
 a commanded combined volume flow rate of the materials passing through the actuators into the tank [commanded  $dv_{in}/dt$ ]; and  
 a commanded combined mass flow rate of the materials passing through the actuators into the tank [commanded  $dm_{in}/dt$ ].
32. The control system of Claim 31, wherein a first actuator is controlled by a first signal based on a function  $f_1$ , where:  

$$f_1 = [\text{commanded } dm_{in}/dt - (\text{commanded } dv_{in}/dt) \times \rho_{m2}] / (\rho_{m1} - \rho_{m2})$$
 wherein:  $\rho_{m1}$  = density of a first material; and  
 $\rho_{m2}$  = density of a second material.  
 and wherein a second actuator is controlled by a second signal based on a function  $f_2$ , where:  

$$f_2 = [(\text{commanded } dv_{in}/dt) \times \rho_{m1} - \text{commanded } dm_{in}/dt] / (\rho_{m1} - \rho_{m2}).$$
33. The control system of Claim 31, wherein the commanded  $dv_{in}/dt$  is based, at least in part, on a volumetric flow rate command feed forward input [ $dv_s/dt$  input] and the commanded  $dm_{in}/dt$  is based, at least in part, on an indication of density of the mixture and a first commanded density of the mixture.
34. The control system of Claim 33, wherein the indication of density is provided by a density observer and the commanded  $dm_{in}/dt$  is further based, at least in part, on a mass flow rate disturbance estimate output by the density observer.
35. The control system of Claim 33, wherein the commanded  $dv_{in}/dt$  is further based, at least in part, on an indication of height of the mixture in the tank and a commanded height of the mixture in the tank.

36. The control system of Claim 35, wherein the indication of height is provided by a height observer and the commanded  $dv_m/dt$  is further based, at least in part, on a volumetric disturbance estimate output by the height observer.

37. A control system for mixing at least two materials, comprising:

a controller operable to control a physical system comprising a plurality of actuators, each actuator being operable to introduce a material into a first tank to form a first mixture;

wherein the controller operates the actuators to control a desired characteristic of the first mixture.

38. The control system of Claim 37, wherein the actuators are selected from the group consisting of valves, screw feeders, augurs, and elevators.

39. The control system of Claim 37, wherein the materials are selected from the group consisting of water, carrier fluid, dry cement material, sand, and proppants.

40. The control system of Claim 37, wherein the controller further operates the actuators to control a desired operating parameter of the physical system.

41. The control system of Claim 37, wherein the controller further operates the actuators based on a combination of sensors, the sensors selected from the group consisting of: a density sensor measuring the density of the first mixture, a flow rate sensor, and a mixture height sensor measuring the height of the first mixture.

42. The control system of Claim 41, wherein the mixture height sensor comprises a height observer.

43. The control system of Claim 41, wherein the density sensor comprises a density observer.

44. The control system of Claim 41, wherein the first mixture overflows the first tank into a second tank to form a second mixture, and wherein the controller further operates the actuators to control a desired characteristic of the second mixture.

45. The control system of Claim 44, wherein the controller employs feed forward based on an input selected from the group consisting of: a combined inflow volume of the materials introduced by the actuators, a volume of the first mixture flowing into the second tank, a volume of the second mixture flowing out of the second tank, a density of the first mixture, and a density of the second mixture.

46. The control system of Claim 44, wherein the sensors are further selected from the group consisting of: a density sensor measuring the density of the second mixture and a mixture height sensor measuring the height of the second mixture.
47. The control system of Claim 46, wherein the mixture height sensor measuring the height of the second mixture comprises a height observer.
48. The control system of Claim 46, wherein the density sensor measuring the density of the second mixture comprises a density observer.
49. A method for mixing at least two materials, comprising:  
introducing the at least two materials into a physical system;  
combining the at least two materials to form a mixture thereof;  
independently controlling a desired characteristic of the mixture of the at least two materials and a desired parameter of the physical system.
50. The method of Claim 49, wherein the controlling involves decoupling a volumetric flow rate disturbance parameter.
51. The method of Claim 49, wherein the controlling involves decoupling a mass flow rate disturbance parameter.
52. A method for mixing at least two materials, comprising:  
determining a commanded combined mass flow rate of the at least two materials into a first tank [commanded  $dm_{in}/dt$ ];  
determining a commanded combined volume flow rate of the at least two materials into the first tank [commanded  $dv_{in}/dt$ ]; and  
independently controlling, based on the commanded  $dm_{in}/dt$  and the commanded  $dv_{in}/dt$ , a density of a mixture of the at least two materials in the first tank [ $\rho_{12}$ ] and a volume flow rate of the mixture out of the first tank [ $dv_{12}/dt$ ].
53. The method of Claim 52, wherein the controlling includes regulating at least two actuators, each actuator being operable to dispense one of the at least two materials, respectively, into the first tank.
54. The method of Claim 52, further including:  
determining a commanded mass flow rate of the mixture from the first tank into a second tank [commanded  $dm_{12}/dt$ ]; and wherein determining the commanded  $dm_{in}/dt$  is based on an indication of the density of the mixture in the first tank and the commanded  $dm_{12}/dt$ ; and

determining a commanded volume flow rate of the mixture from the first tank into the second tank [commanded  $dv_{12}/dt$ ]; and wherein determining the commanded  $dv_{in}/dt$  is based on an indication of a height of the mixture in the first tank and the commanded  $dv_{12}/dt$ .

55. The method of Claim 54, further comprising:

determining a desired height of the mixture in the second tank [input  $h_2$ ];

determining a desired volume flow rate of the mixture out of the second tank [input  $dv_s/dt$ ], wherein determining the commanded  $dv_{12}/dt$  is based on the input  $h_2$ , the input  $dv_s/dt$ , and an indication of a height of the mixture in the second tank; and

determining a desired density of the mixture in the second tank [input  $\rho_s$ ], wherein determining the commanded  $dm_{12}/dt$  is based on the input  $\rho_s$  and an indication of a density of the mixture in the second tank.

56. The method of Claim 55, further comprising:

sensing the density of the mixture in the first tank [ $\rho_{12}$  sensor];

determining an estimated density of the mixture in the first tank [estimated  $\rho_{12}$ ] based on the  $\rho_{12}$  sensor and on the commanded  $dm_{12}/dt$ ;

providing the estimated  $\rho_{12}$  as the indication of the density of the mixture in the first tank;

sensing the density of the mixture in the second tank [ $\rho_s$  sensor];

determining an estimated density of the mixture in the second tank [estimated  $\rho_s$ ] based on  $\rho_s$  sensor and on the indication of the density of the mixture in the first tank; and

providing the estimated  $\rho_s$  as the indication of the density of the mixture in the second tank.

57. The method of Claim 55, further comprising:

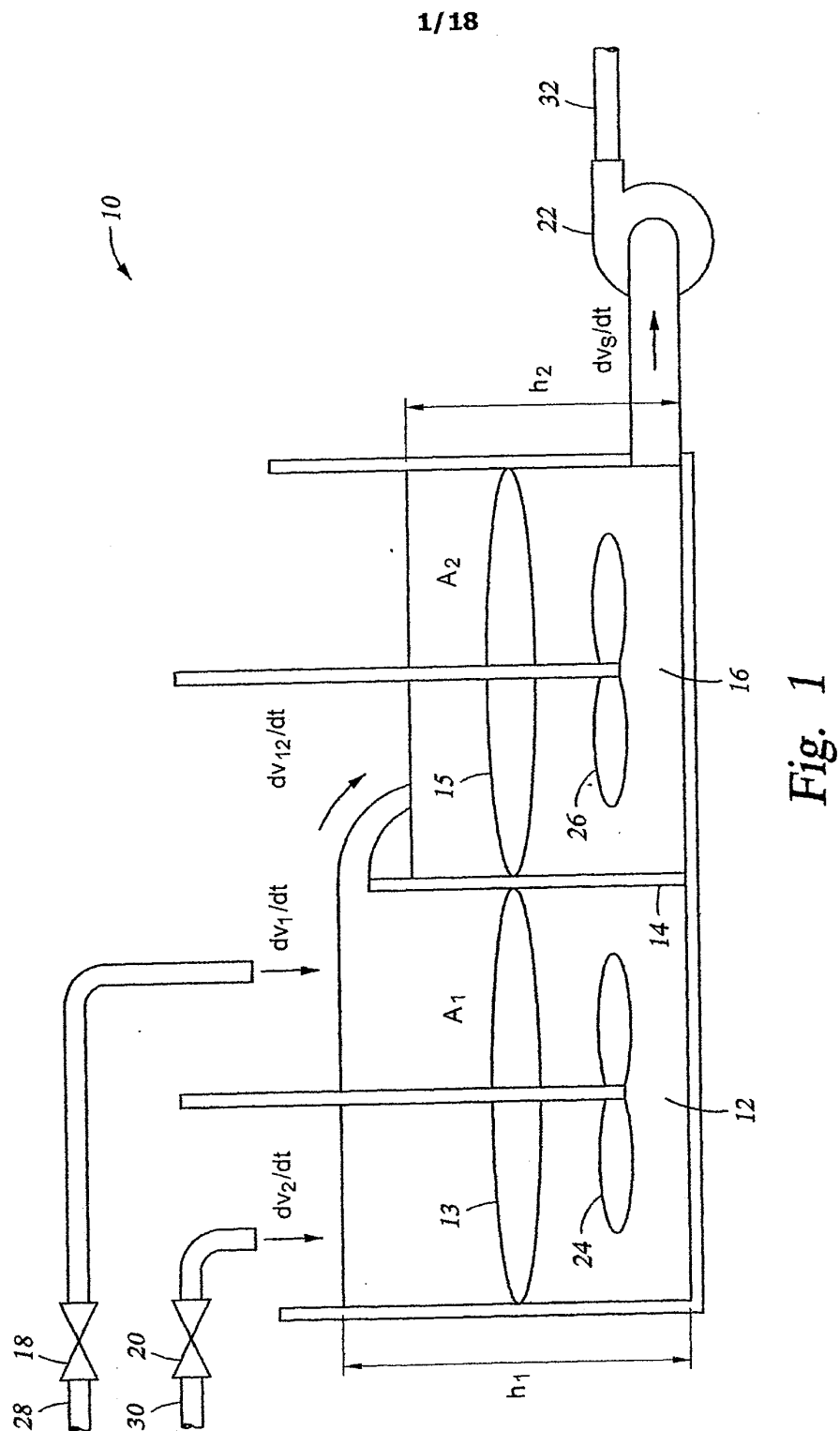
sensing the height of the mixture in the first tank [ $h_1$  sensor];

determining an estimated height of the mixture in the first tank [ $h_1$  estimated] based on  $h_1$  sensor and on the commanded  $dv_{12}/dt$ ;

providing the estimated  $h_1$  as the indication of the height of the mixture in the first tank;

sensing the height of the mixture in the second tank [ $h_2$  sensor];

determining an estimated height of the mixture in the second tank [ $h_2$  estimated]  
based on  $h_2$  sensor and on the indication of the height of the mixture in the  
first tank; and  
providing the estimated  $h_2$  as the indication of the height of the second mixture in  
the second tank.



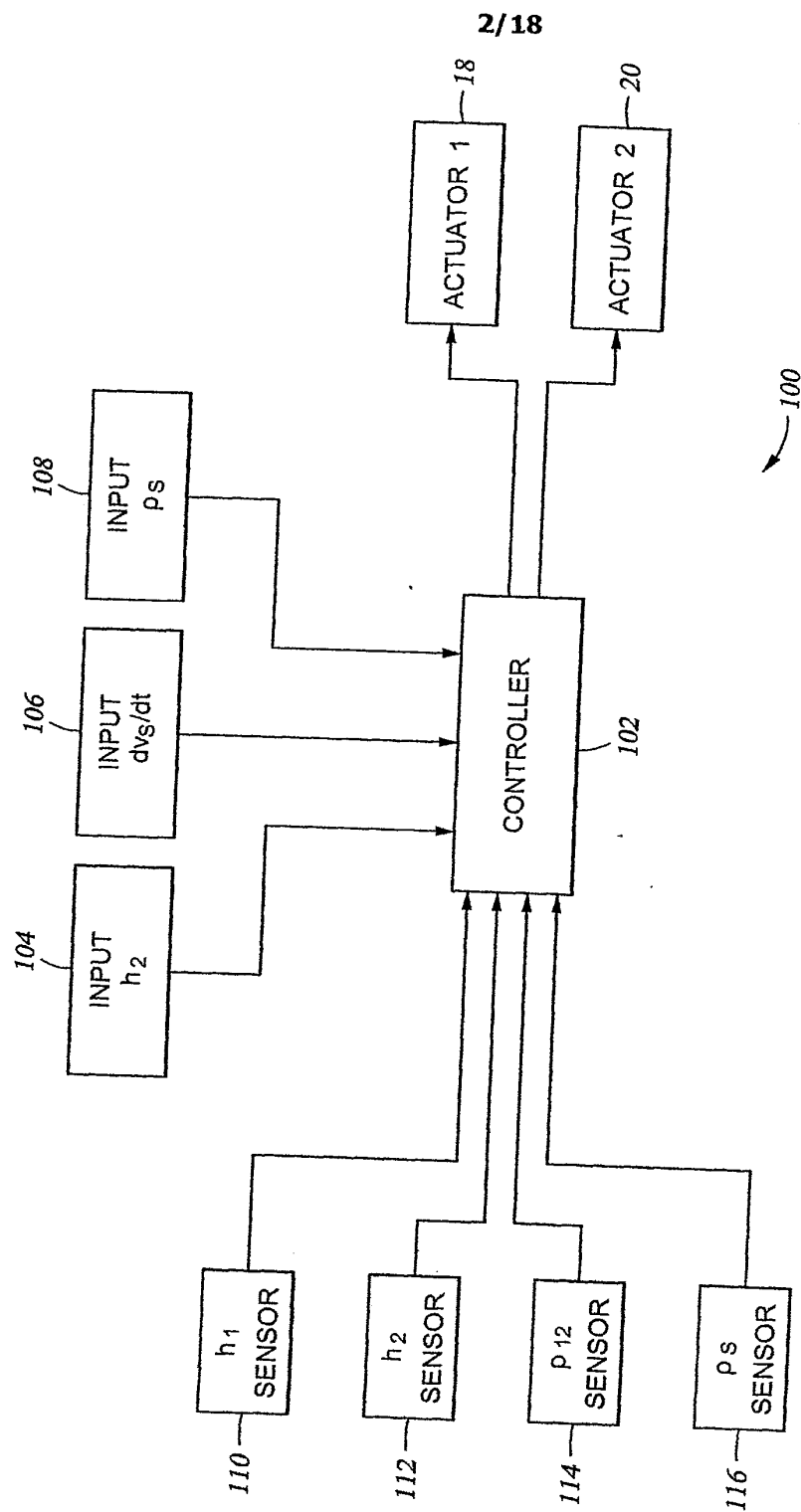


Fig. 2

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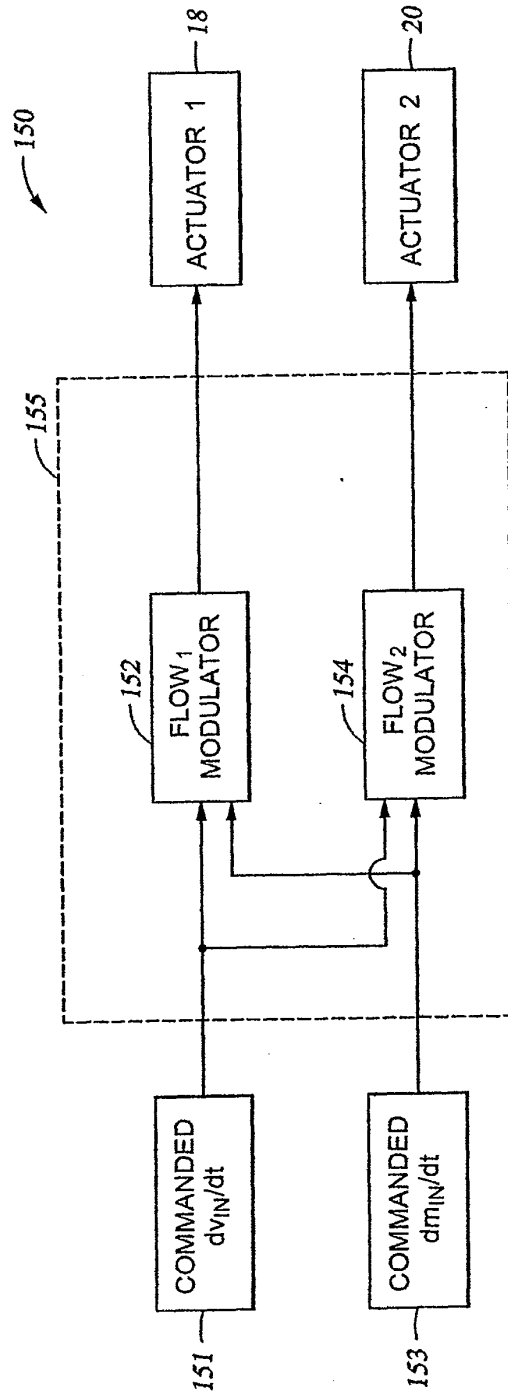


Fig. 3

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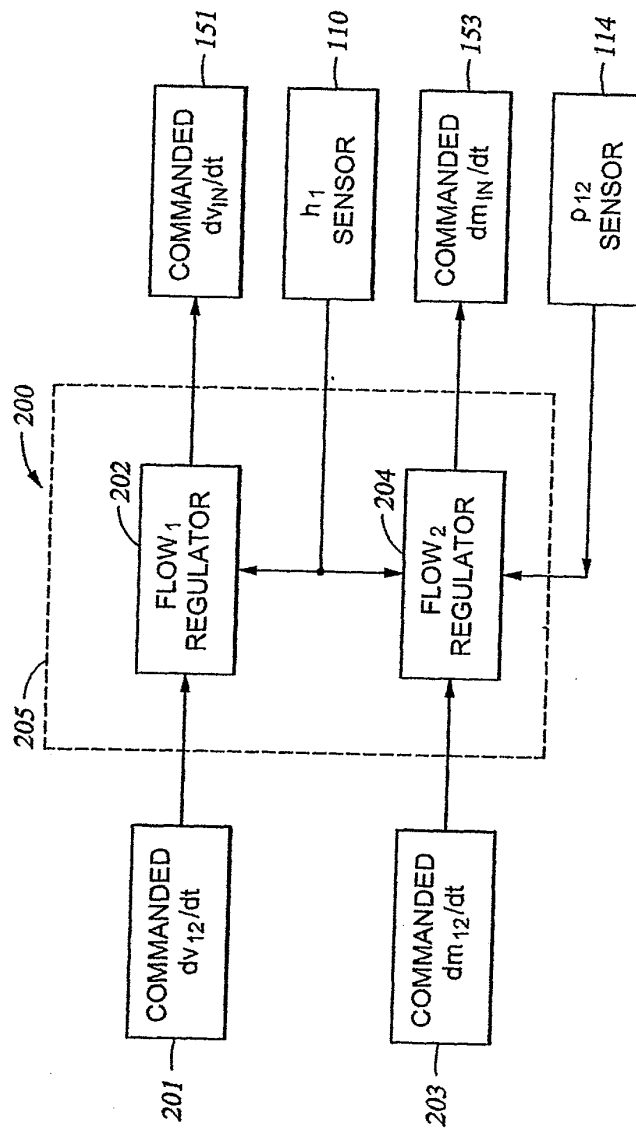


Fig. 4

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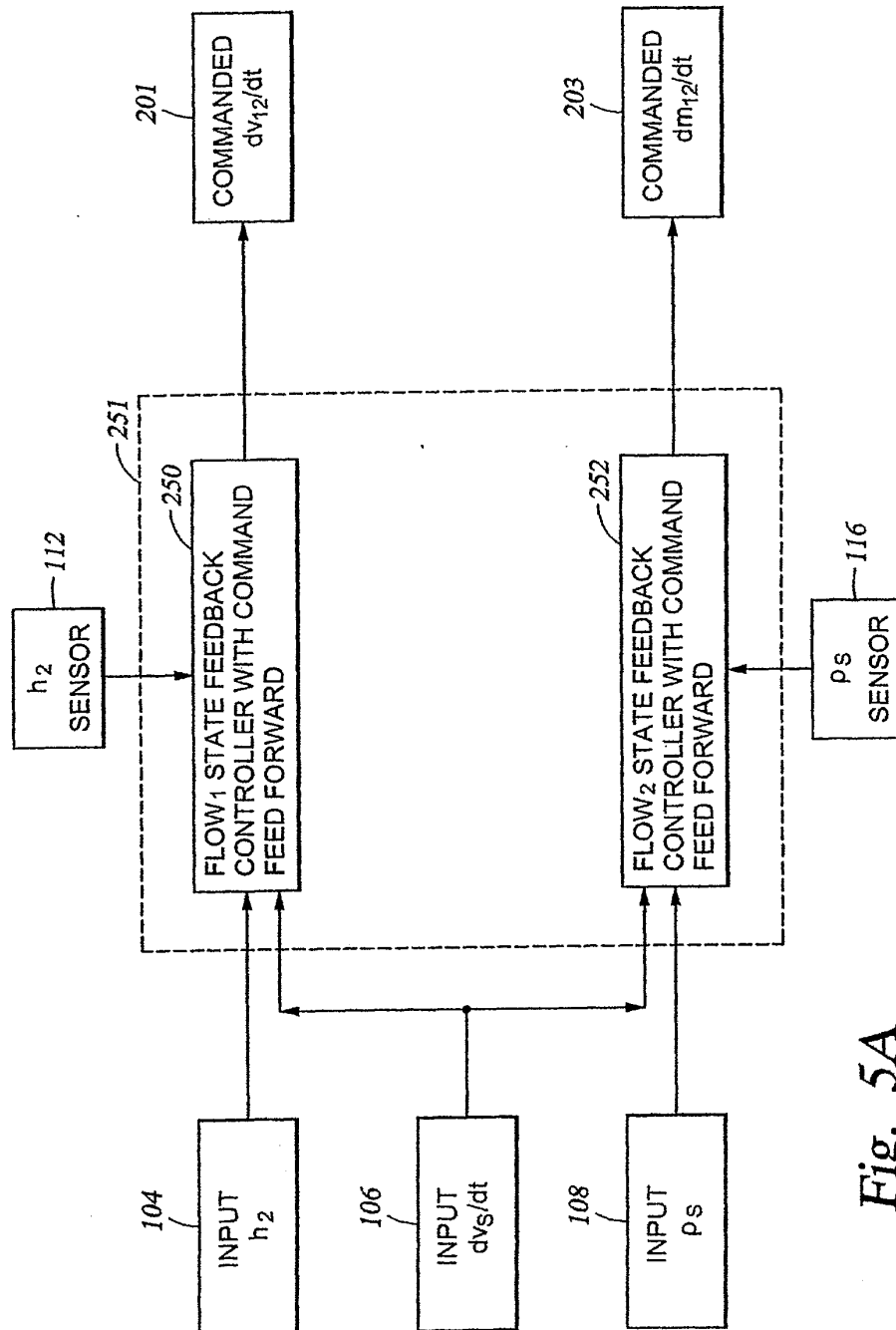


Fig. 5A

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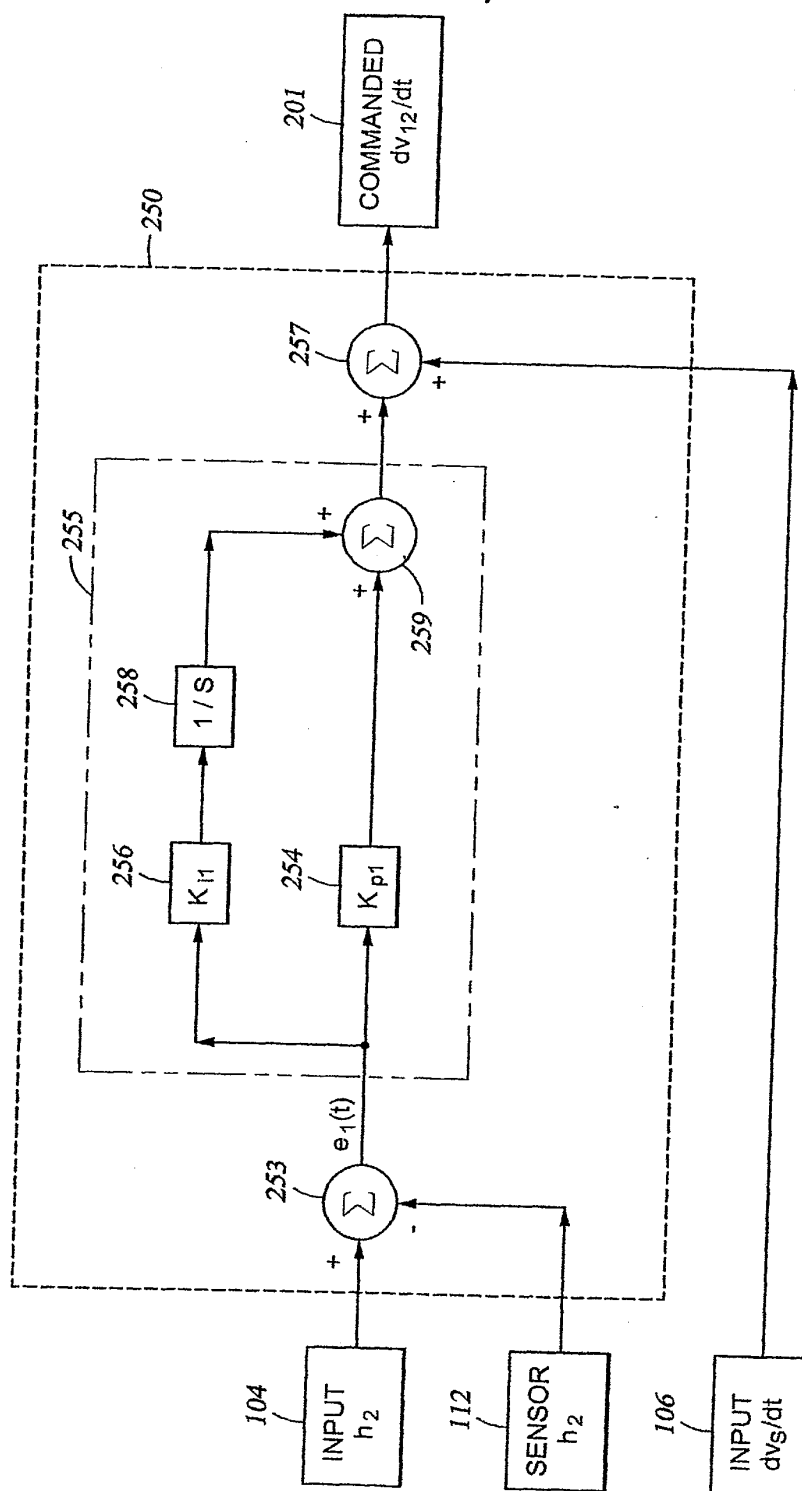


Fig. 5B

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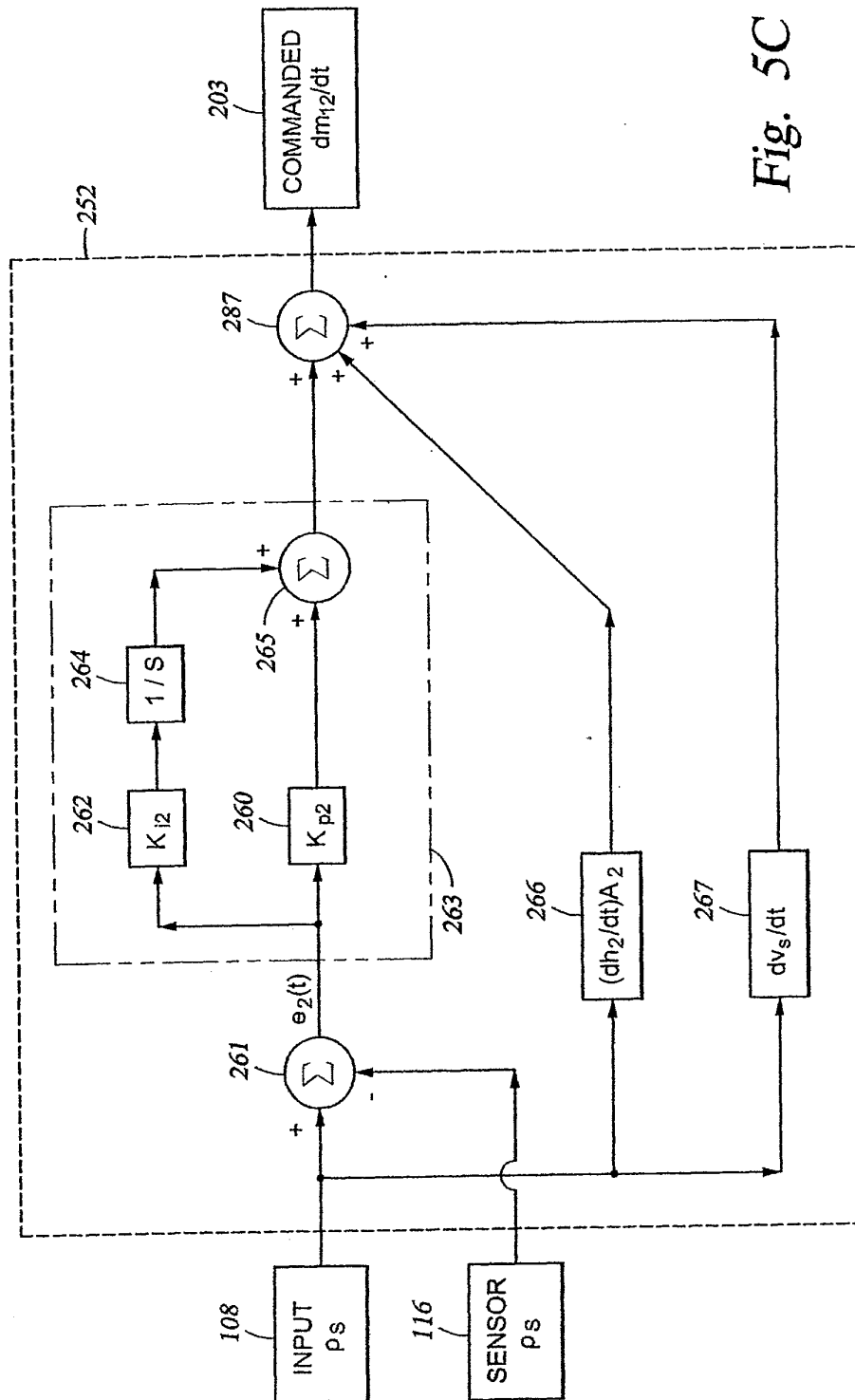


Fig. 5C

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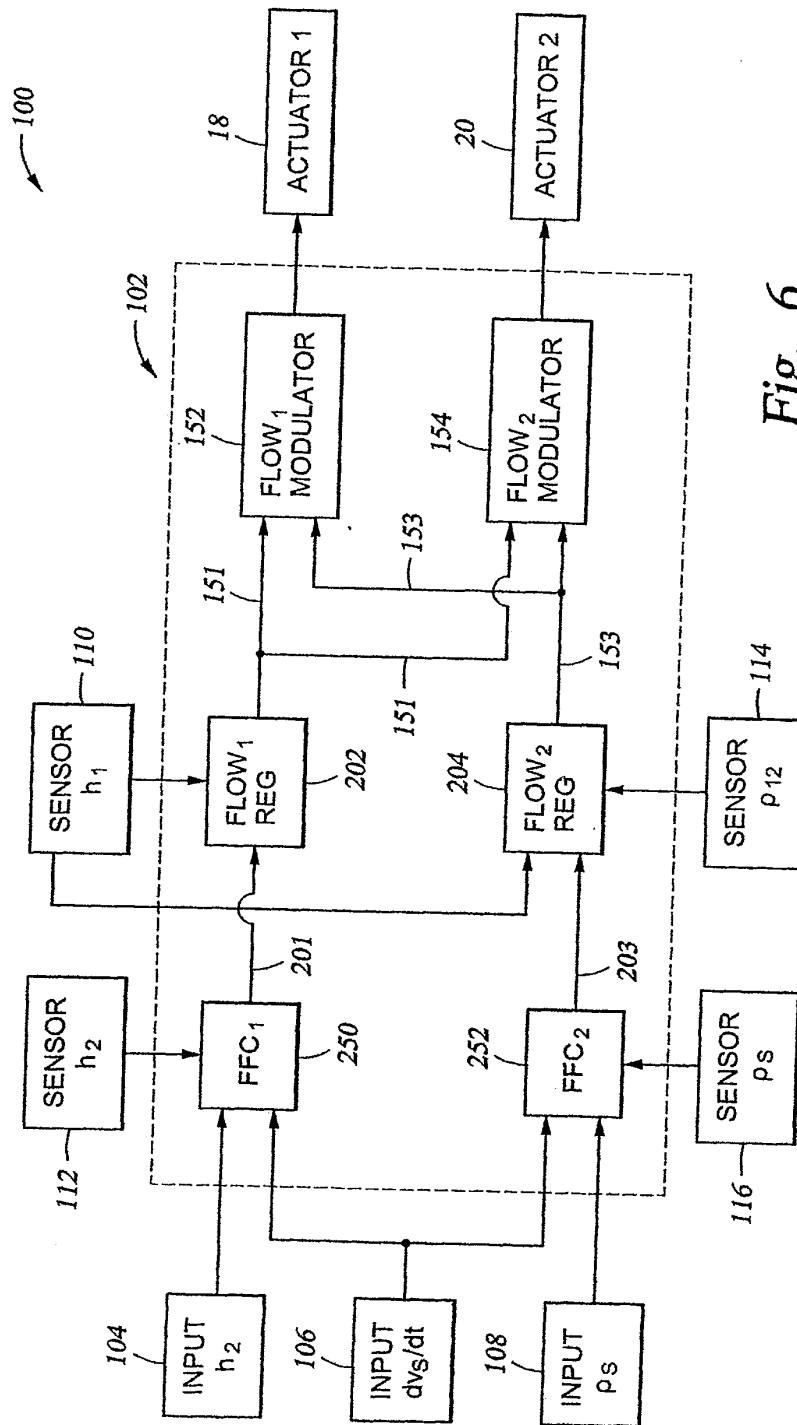
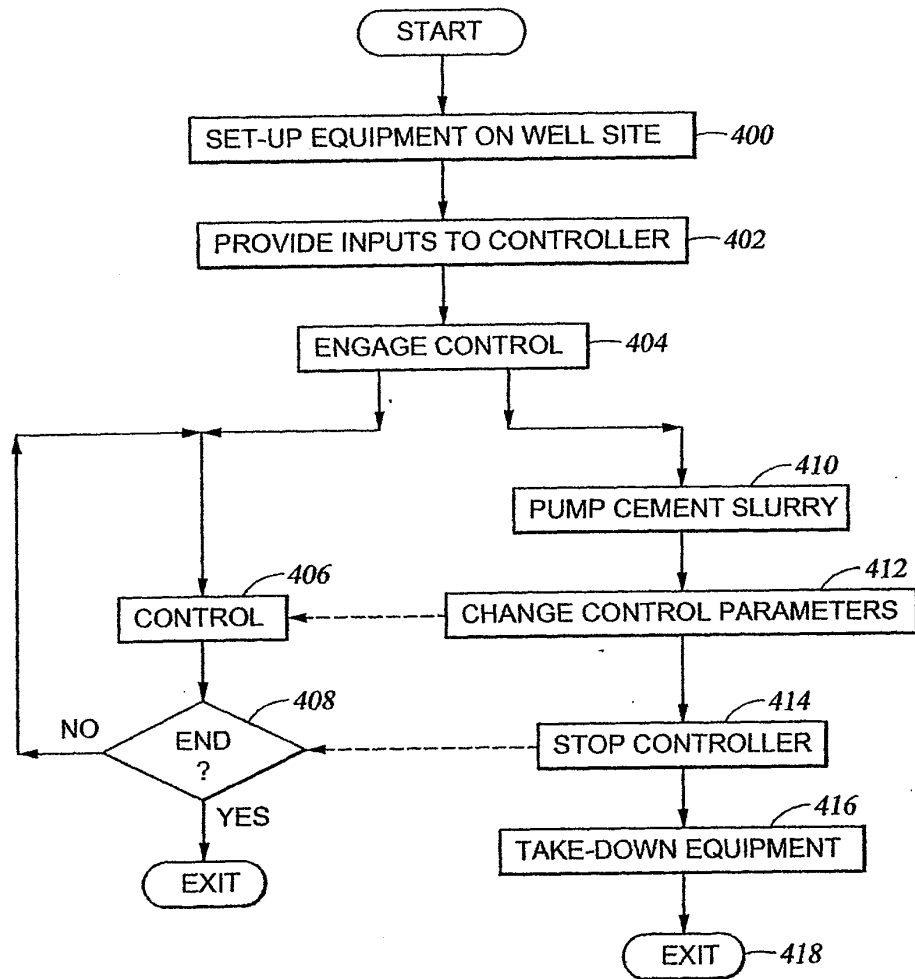


Fig. 6

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*Fig. 7*

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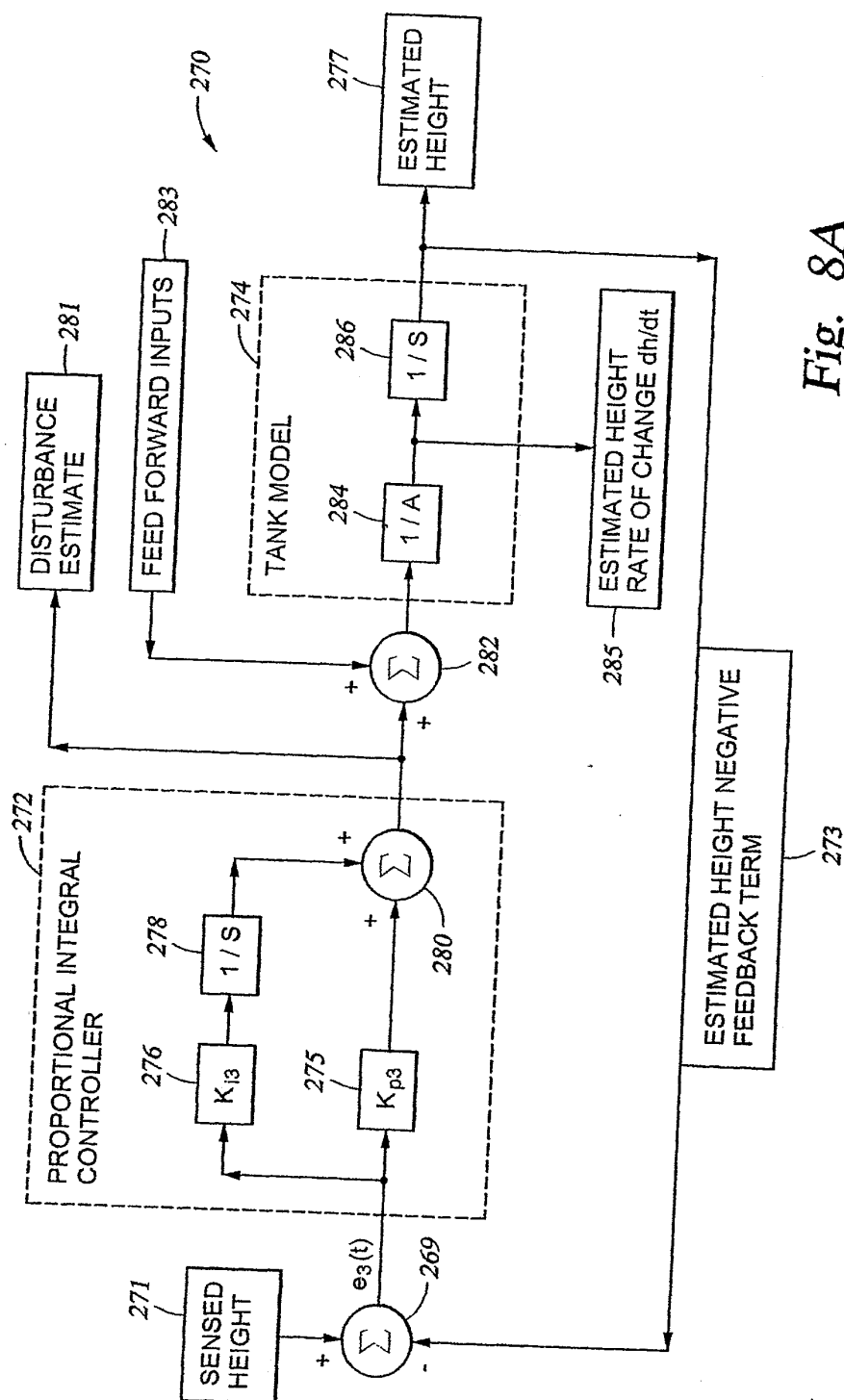


Fig. 8A

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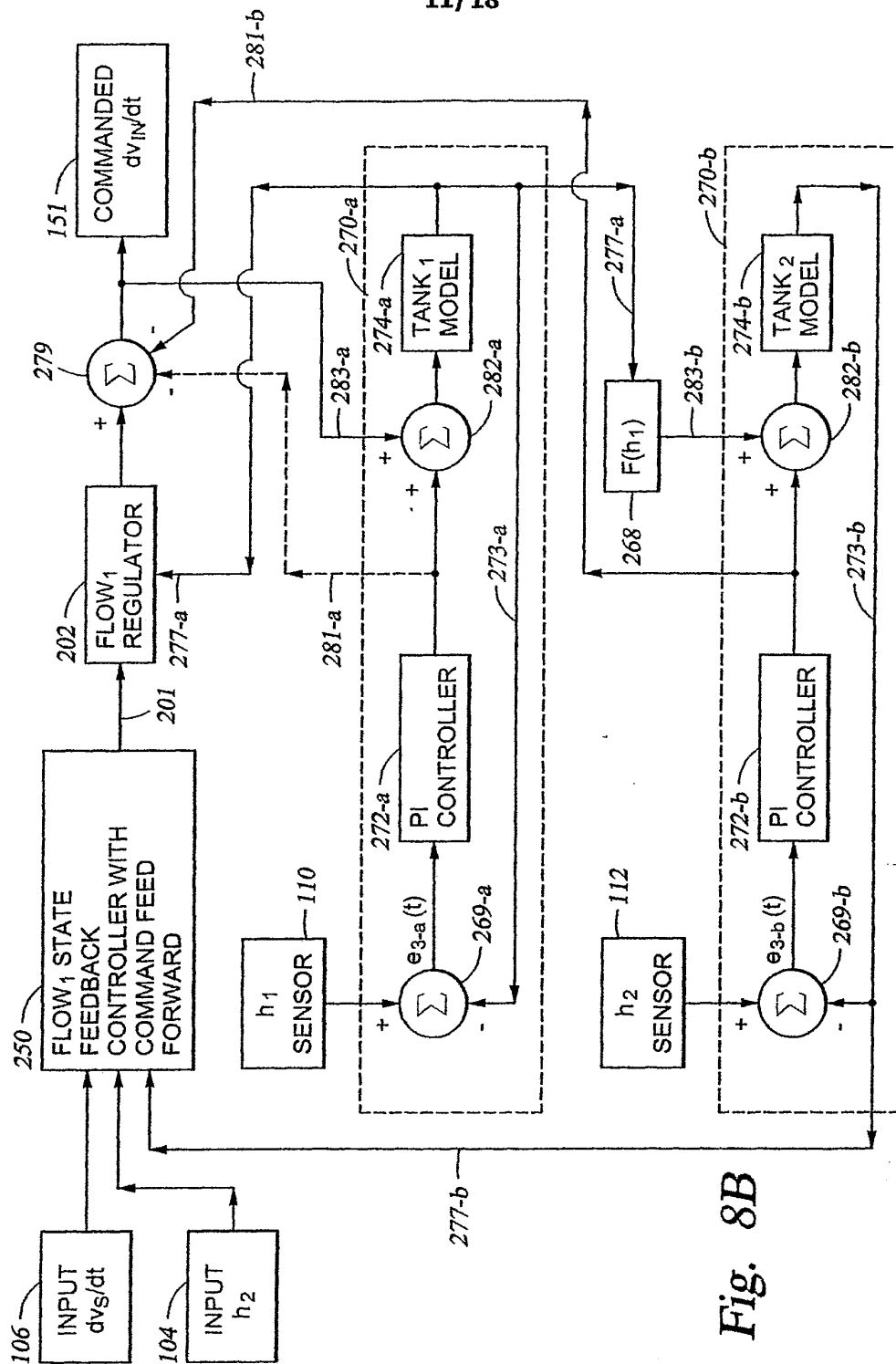


Fig. 8B

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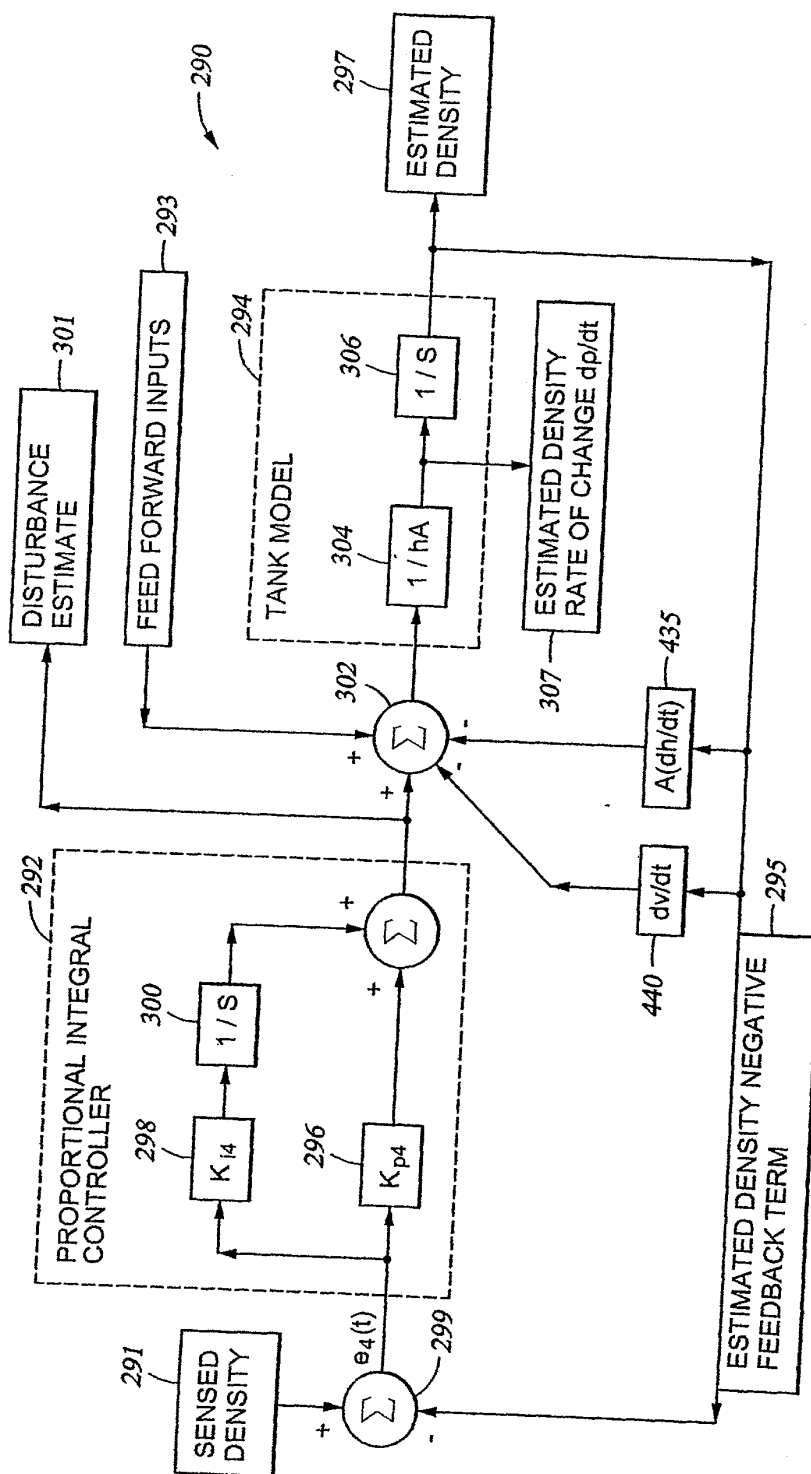


Fig. 9A

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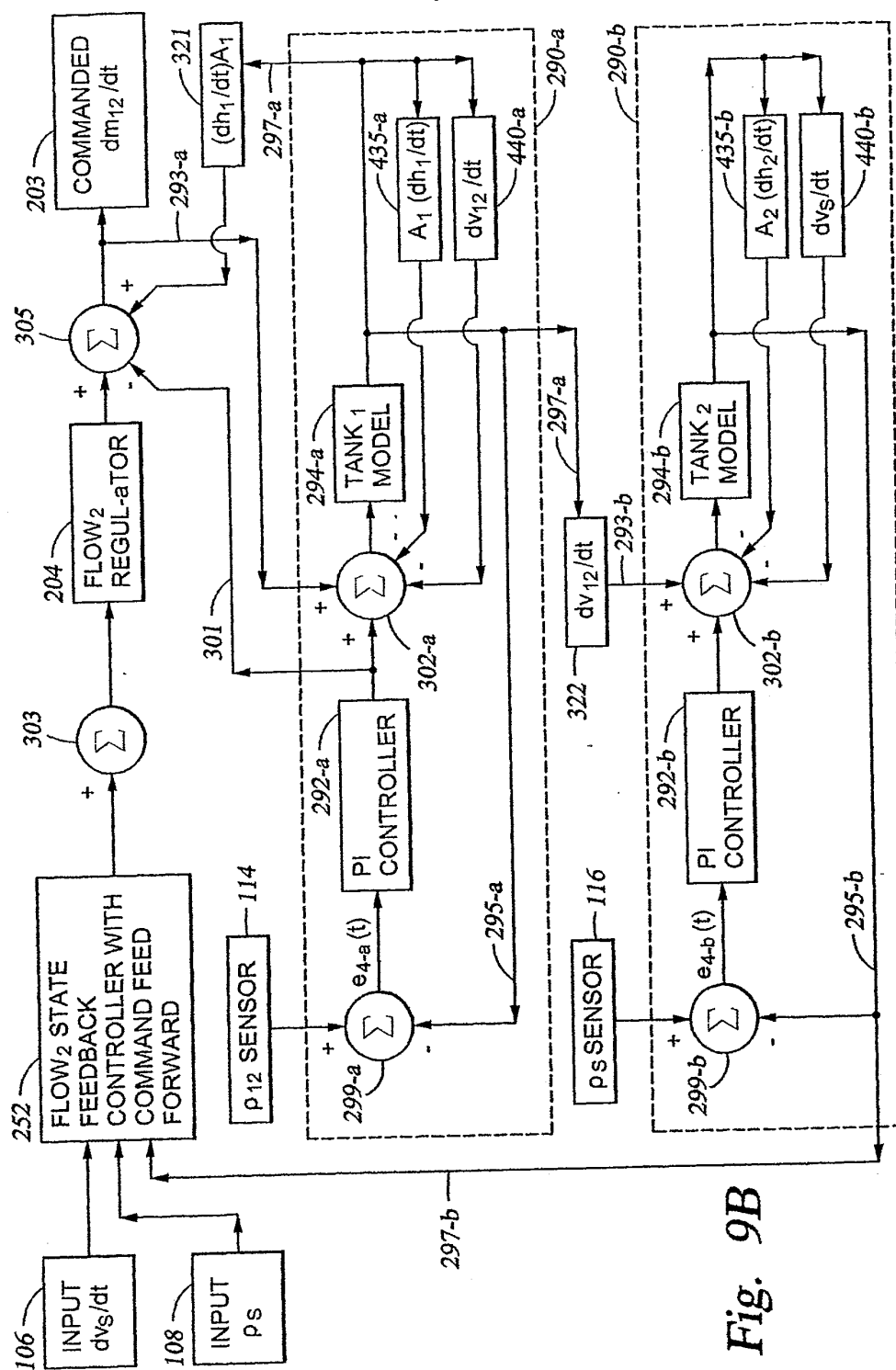


Fig. 9B

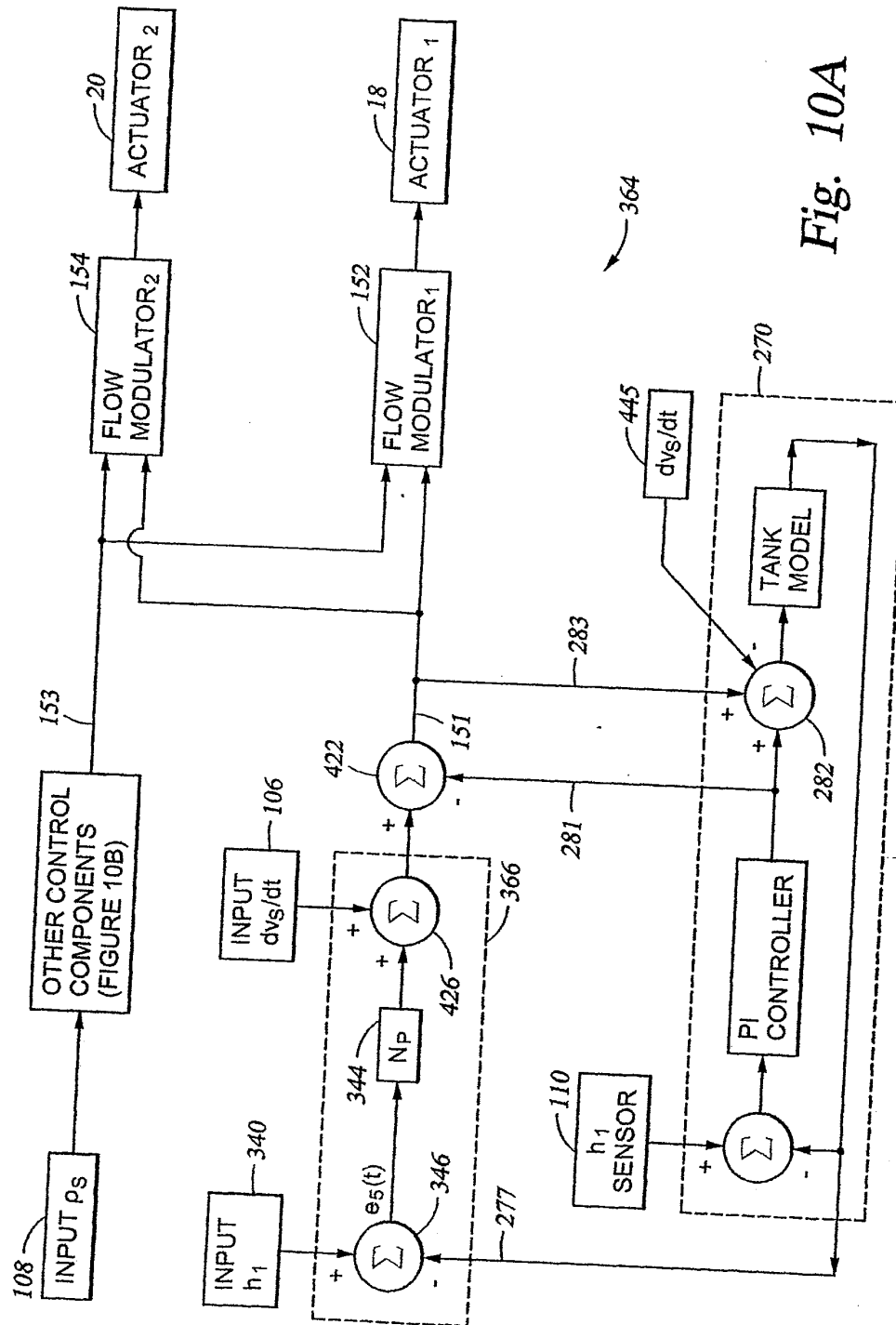
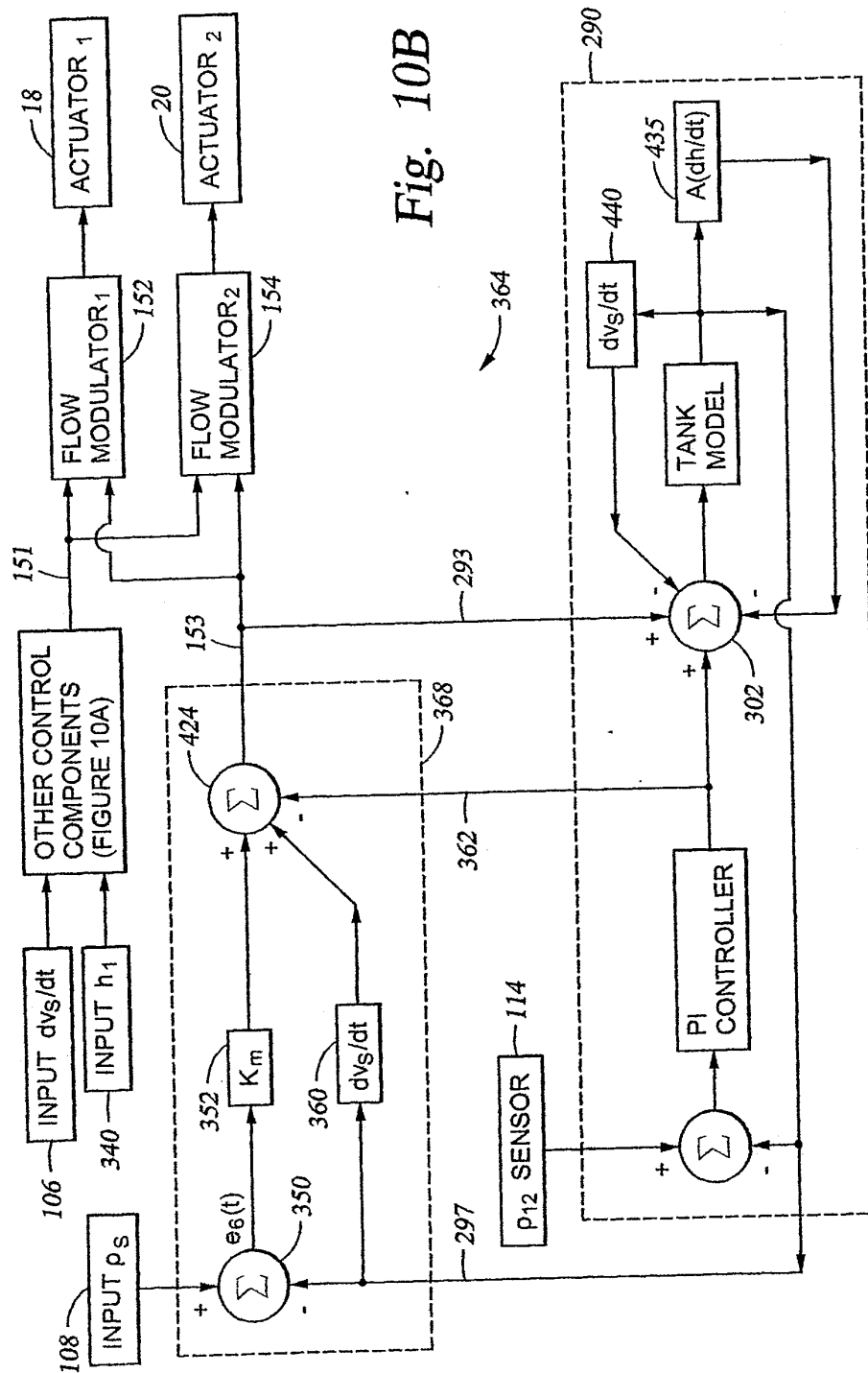
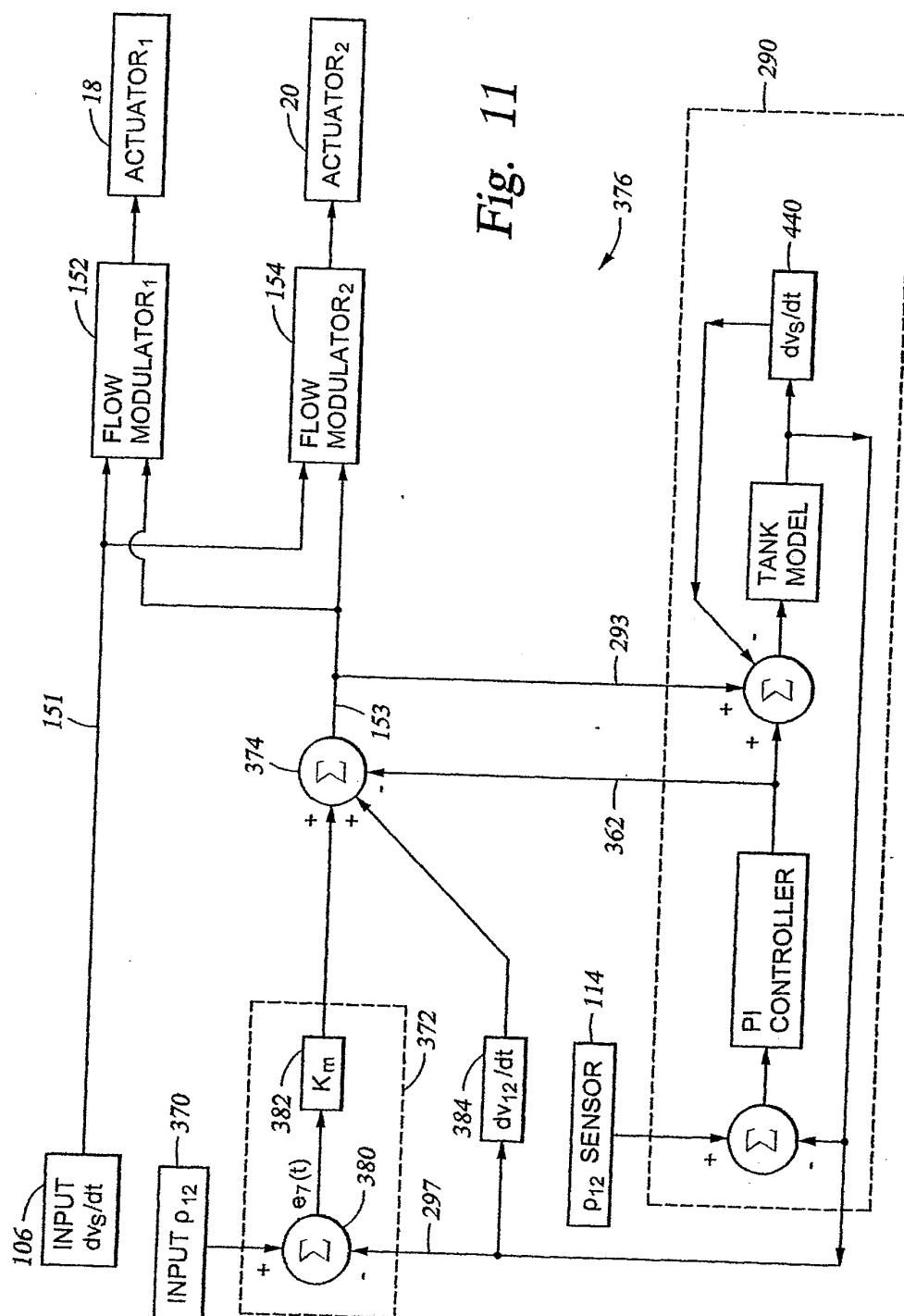


Fig. 10A





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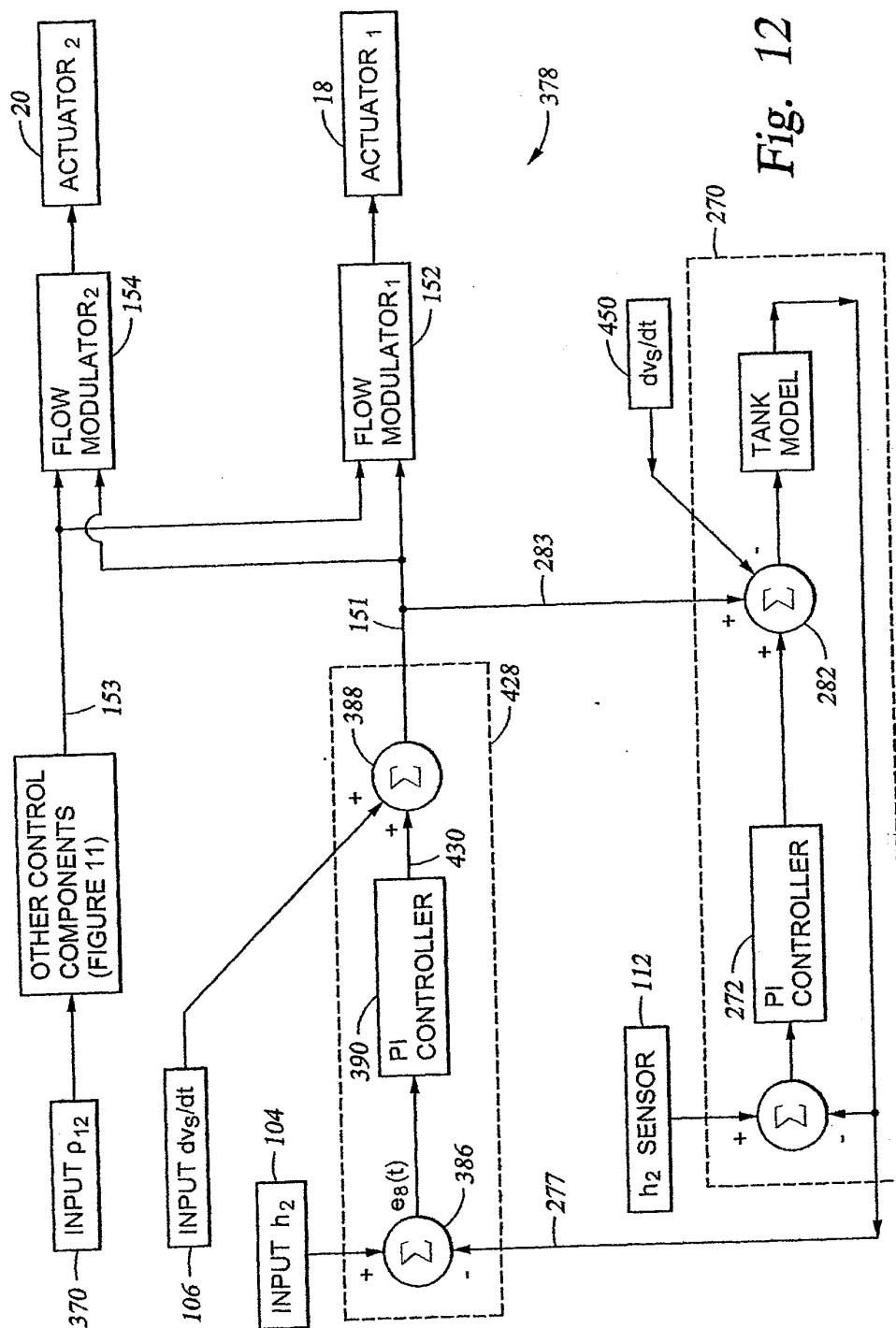


Fig. 12

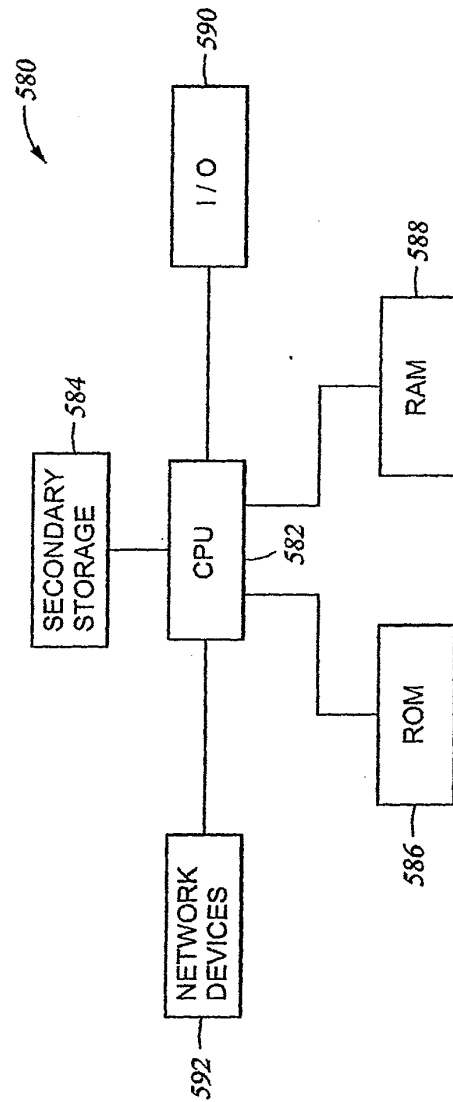


Fig. 13

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2006/001302

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                    |                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------|
| A. CLASSIFICATION OF SUBJECT MATTER<br>INV. G05D11/13 B01F15/04 E21B33/13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                    |                                                                  |
| According to International Patent Classification (IPC) or to both national classification and IPC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                    |                                                                  |
| B. FIELDS SEARCHED<br>Minimum documentation searched (classification system followed by classification symbols)<br>G05D B01F E21B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                    |                                                                  |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                    |                                                                  |
| Electronic data base consulted during the international search (name of data base and, where practical, search terms used)<br>EPO-Internal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                    |                                                                  |
| C. DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                    |                                                                  |
| Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No.                                            |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | US 5 289 877 A (NAEGELE ET AL)<br>1 March 1994 (1994-03-01)                        | 30,<br>37-43,<br>49-51                                           |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | column 1, line 1 - column 5, line 20;<br>figures 1A,1B,2                           | 1-3,<br>44-48                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                    | 4-29,<br>31-36,<br>52-57                                         |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | US 5 103 908 A (ALLEN ET AL)<br>14 April 1992 (1992-04-14)                         | 1-3,<br>44-48                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | the whole document                                                                 | 4-43,<br>49-57                                                   |
| Y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | US 5 775 803 A (MONTGOMERY ET AL)<br>7 July 1998 (1998-07-07)                      | 1-3,<br>44-48                                                    |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | column 1, line 27 - column 7, line 27;<br>figure 1                                 | 4-43,<br>49-57                                                   |
| -/-                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                    |                                                                  |
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| Date of the actual completion of the international search<br>6 July 2006                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                    | Date of mailing of the international search report<br>17/07/2006 |
| Name and mailing address of the ISA/<br>European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                    | Authorized officer<br>Vaño Gea, J                                |

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page 1 of 2

# INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2006/001302

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No.    |
|-----------|------------------------------------------------------------------------------------|--------------------------|
| X         | US 4 397 561 A (STRONG ET AL)<br>9 August 1983 (1983-08-09)                        | 30,<br>37-43,<br>49-51   |
| Y         | the whole document                                                                 | 1-3,<br>44-48            |
| A         |                                                                                    | 4-29,<br>31-36,<br>52-57 |

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# INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2006/001302

| Patent document<br>cited in search report |   | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|---|---------------------|----------------------------|---------------------|
| US 5289877                                | A | 01-03-1994          | CA 2102649 A1              | 11-05-1994          |
| US 5103908                                | A | 14-04-1992          | NONE                       |                     |
| US 5775803                                | A | 07-07-1998          | NONE                       |                     |
| US 4397561                                | A | 09-08-1983          | NONE                       |                     |

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| Electronic Patent Application Fee Transmittal |          |                                                  |        |                      |
|-----------------------------------------------|----------|--------------------------------------------------|--------|----------------------|
| Application Number:                           |          | 11873186                                         |        |                      |
| Filing Date:                                  |          | 16-Oct-2007                                      |        |                      |
| Title of Invention:                           |          | Method and System for Centralized Well Treatment |        |                      |
| First Named Inventor/Applicant Name:          |          | Jim B. Surjaatmadja                              |        |                      |
| Filer:                                        |          | Paul N. Katz/Debbie Allen                        |        |                      |
| Attorney Docket Number:                       |          | 2006-IP-021186U1                                 |        |                      |
| Filed as Large Entity                         |          |                                                  |        |                      |
| Utility under 35 USC 111(a) Filing Fees       |          |                                                  |        |                      |
| Description                                   | Fee Code | Quantity                                         | Amount | Sub-Total in USD(\$) |
| Basic Filing:                                 |          |                                                  |        |                      |
| Pages:                                        |          |                                                  |        |                      |
| Claims:                                       |          |                                                  |        |                      |
| Miscellaneous-Filing:                         |          |                                                  |        |                      |
| Petition:                                     |          |                                                  |        |                      |
| Patent-Appeals-and-Interference:              |          |                                                  |        |                      |
| Post-Allowance-and-Post-Issuance:             |          |                                                  |        |                      |
| Extension-of-Time:                            |          |                                                  |        |                      |

| Description                             | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
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| <b>Miscellaneous:</b>                   |          |          |        |                      |
| Submission- Information Disclosure Stmt | 1806     | 1        | 180    | 180                  |
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| <b>Electronic Acknowledgement Receipt</b>   |                                                  |
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| <b>EFS ID:</b>                              | 4116914                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Paul N. Katz/Debbie Allen                        |
| <b>Filer Authorized By:</b>                 | Paul N. Katz                                     |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 15-OCT-2008                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 12:58:57                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

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| 1                                                                                                 |                                                      | 0637181162IDS.PDF | 7689099                                  | yes              | 174              |
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| 2                                                                                                 | Fee Worksheet (PTO-06)                               | fee-info.pdf      | 30230                                    | no               | 2                |
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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                      | 11873186   |
|                                                                                                     | Filing Date            |                      | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |
|                                                                                                     | Art Unit               | 3676                 |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

| U.S.PATENTS                                                                                                |         |                    |                        |                  |                                                 |                                                                        |
|------------------------------------------------------------------------------------------------------------|---------|--------------------|------------------------|------------------|-------------------------------------------------|------------------------------------------------------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number      | Kind Code <sup>1</sup> | Issue Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|                                                                                                            | 1       | 5574218            |                        | 1996-11-12       | Withers                                         |                                                                        |
|                                                                                                            | 2       | 6575247            |                        | 2003-06-10       | Tolman, et al.                                  |                                                                        |
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|                                                                                                            | 1       | 20030050758        | A1                     | 2003-03-13       | Soliman, Mohamed Y., et al.                     |                                                                        |
|                                                                                                            | 2       | 20060289167        | A1                     | 2006-12-28       | Surjaatmadja, Jim B., et al.                    |                                                                        |
|                                                                                                            | 3       | 20080083538        | A1                     | 2008-04-10       | Soliman, Mohamed Y.                             |                                                                        |
|                                                                                                            | 4       | 20030141064        | A1                     | 2003-07-31       | Roberson, James David, Jr.                      |                                                                        |
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| Application Number     | 11873186             |
| Filing Date            | 2007-10-16           |
| First Named Inventor   | Surjaatmadja         |
| Art Unit               | 3676                 |
| Examiner Name          | Bates, Zakiya W.     |
| Attorney Docket Number | HES 2006-IP-021186U1 |

| Examiner Initial* | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
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|------------------------|----------------------|
| Application Number     | 11873186             |
| Filing Date            | 2007-10-16           |
| First Named Inventor   | Surjaatmadja         |
| Art Unit               | 3676                 |
| Examiner Name          | Bates, Zakiya W.     |
| Attorney Docket Number | HES 2006-IP-021186U1 |

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

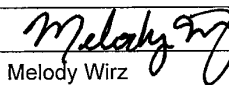
**OR**

- ☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |          |
|------------|-------------------------------------------------------------------------------------|---------------------|----------|
| Signature  |  | Date (YYYY-MM-DD)   | 11-26-08 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783   |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Patent Application Fee Transmittal |          |                                                  |        |                      |
|-----------------------------------------------|----------|--------------------------------------------------|--------|----------------------|
| Application Number:                           |          | 11873186                                         |        |                      |
| Filing Date:                                  |          | 16-Oct-2007                                      |        |                      |
| Title of Invention:                           |          | Method and System for Centralized Well Treatment |        |                      |
| First Named Inventor/Applicant Name:          |          | Jim B. Surjaatmadja                              |        |                      |
| Filer:                                        |          | Paul N. Katz/Debbie Allen                        |        |                      |
| Attorney Docket Number:                       |          | 2006-IP-021186U1                                 |        |                      |
| Filed as Large Entity                         |          |                                                  |        |                      |
| Utility under 35 USC 111(a) Filing Fees       |          |                                                  |        |                      |
| Description                                   | Fee Code | Quantity                                         | Amount | Sub-Total in USD(\$) |
| Basic Filing:                                 |          |                                                  |        |                      |
| Pages:                                        |          |                                                  |        |                      |
| Claims:                                       |          |                                                  |        |                      |
| Miscellaneous-Filing:                         |          |                                                  |        |                      |
| Petition:                                     |          |                                                  |        |                      |
| Patent-Appeals-and-Interference:              |          |                                                  |        |                      |
| Post-Allowance-and-Post-Issuance:             |          |                                                  |        |                      |
| Extension-of-Time:                            |          |                                                  |        |                      |

| Description                             | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|-----------------------------------------|----------|----------|--------|----------------------|
| <b>Miscellaneous:</b>                   |          |          |        |                      |
| Submission- Information Disclosure Stmt | 1806     | 1        | 180    | 180                  |
| <b>Total in USD (\$)</b>                |          |          |        | <b>180</b>           |

| <b>Electronic Acknowledgement Receipt</b>   |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <b>EFS ID:</b>                              | 4364738                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Paul N. Katz/Debbie Allen                        |
| <b>Filer Authorized By:</b>                 | Paul N. Katz                                     |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 26-NOV-2008                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 17:22:00                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

### **Payment information:**

|                                                                                                                                                                                                                                                                                                    |                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Submitted with Payment                                                                                                                                                                                                                                                                             | yes             |
| Payment Type                                                                                                                                                                                                                                                                                       | Deposit Account |
| Payment was successfully received in RAM                                                                                                                                                                                                                                                           | \$180           |
| RAM confirmation Number                                                                                                                                                                                                                                                                            | 4201            |
| Deposit Account                                                                                                                                                                                                                                                                                    | 020383          |
| Authorized User                                                                                                                                                                                                                                                                                    |                 |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)<br>Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) |                 |

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

**File Listing:**

| Document Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Document Description                                 | File Name         | File Size(Bytes)/ Message Digest                                | Multi Part /.zip | Pages (if appl.) |
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| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      | 0637181162IDS.PDF | 1074964<br><div>62803c2c08b54beb41570b3cd46a3ed0c24e7b7f1</div> | yes              | 29               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Multipart Description/PDF files in .zip description  |                   |                                                                 |                  |                  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | NPL Documents                                        |                   | 15                                                              | 29               |                  |
| Warnings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      |                   |                                                                 |                  |                  |
| Information:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |                   |                                                                 |                  |                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Fee Worksheet (PTO-06)                               | fee-info.pdf      | 30230<br><div>78fa9c5f7898ab2456f9f6c0aa7f920c6abb2133</div>    | no               | 2                |
| Warnings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      |                   |                                                                 |                  |                  |
| Information:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |                   |                                                                 |                  |                  |
| Total Files Size (in bytes):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |                   | 1105194                                                         |                  |                  |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                      |                   |                                                                 |                  |                  |

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:  
**JIM B. SURJAATMADJA**  
  
Serial No.: **11/873,186**  
  
Filed: **OCTOBER 16, 2007**  
  
Title: **"METHOD AND SYSTEM FOR  
CENTRALIZED WELL TREATMENT"**

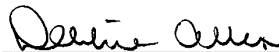
§ Group Art Unit: **3676**  
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§ Confirmation No.: **1172**  
§  
§ Examiner: **BATES, ZAKIYA W.**  
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§ Atty. Docket No: **2006-IP-021186U1**  
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**MAIL STOP AMENDMENT**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, Va 22313-1450**

CERTIFICATE OF FILING ELECTRONICALLY VIA EFS  
37 C.F.R. § 1.8

I HEREBY CERTIFY THAT I HAVE A REASONABLE BASIS FOR BELIEF THAT THIS CORRESPONDENCE IS BEING SUBMITTED TO THE UNITED STATES PATENT AND TRADEMARK OFFICE VIA EFS (ELECTRONICALLY) ON THE DATE INDICATED BELOW, AND IS ADDRESSED TO:

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DEBBIE ALLEN

DATE OF SUBMISSION: DECEMBER 23, 2008  
ELECTRONIC FILING (EFS)

**AMENDMENT AND RESPONSE UNDER 37 C.F.R. § 1.111 TO  
NON-FINAL OFFICE ACTION, MAILED SEPTEMBER 24, 2008**

Dear Honorable Commissioner:

In response to the Office Action mailed on September 24, 2008 (the "Office Action"), Applicants submit the following:

- **Amendments to the Specification**, which begin on page 2 of this paper;
- **Amendments to the Claims**, which begin on page 3 of this paper and
- **Remarks/Arguments**, which begin on page 11 of this paper.

**AMENDMENTS TO THE SPECIFICATION**

Please replace the abstract of the specification with the following amended abstract.

A method of servicing multiple well locations from a central location ~~is disclosed~~ that includes the steps of configuring a central location for distribution of well development task fluids to centralized service factories through fluid lines; preparing the treatment fluids at the centralized service factories; and treating wells with the treatment fluids according to well development tasks associated with each well. A system for centralized well treatment operations ~~is disclosed~~ that includes a centralized well treatment center which pumps well development task fluids to centralized service factories; a plurality of systems with well development mechanisms; a first connection and second connection between a well and the centralized service factories, wherein the connections are directed to flowing and recovering treatment fluids respectively; a third and fourth connection between another well and the well treatment factory, wherein the connections are directed to flowing and recovering treatment fluids respectively.

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Claims:**

1. (Original) A method of providing centralized well development services to a plurality of wells, comprising the steps of:

flowing from a centralized well treatment fluid center to one or more centralized service factories one or more well development task fluids, wherein the one or more centralized service factories are selectively configurable to receive the one or more well development task fluids;

preparing, at the one or more centralized service factories, one or more well treatment fluids from the one or more well development task fluids, wherein the one or more centralized service factories are selectively configurable to prepare the one or more well treatment fluids;

flowing from the one or more centralized service factories to at least one of the plurality of wells the one or more well treatment fluids, wherein the one or more centralized service factories are selectively configurable to flow the one or more well treatment fluids;

recovering from the at least one of the plurality of wells the one or more well treatment fluids at the one or more centralized service factories, wherein the one or more centralized service factories are selectively configurable to receive the one or more recovered well treatment fluids; and

flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more recovered well treatment fluids, wherein the one or more centralized service factories are selectively configurable to flow the one or more recovered well treatment fluids, and wherein the centralized well treatment fluid center is selectively configurable to receive the one or more recovered well treatment fluids.

2. (Currently Amended) The method of claim Claim-1, wherein at least two well development task fluids are provided and they comprise different compositions.

3. (Currently Amended) The method of claim Claim-1, further comprising the step[[s]] of:

disposing of at least one of the one or more recovered well treatment fluids at the centralized well treatment fluid center, wherein the centralized well treatment fluid center is configurable to dispose of the at least one of the one or more recovered well treatment fluids.

4. (Currently Amended) The method of claim ~~Claim~~—1, further comprising the step[[s]] of:

reconditioning at least one of the one or more recovered well treatment fluids at the centralized well treatment fluid center, wherein the centralized well treatment fluid center is configurable to recondition the at least one of the one or more recovered well treatment fluids.

5. (Original) The method of claim 1, wherein at least one of the one or more well treatment fluids comprises a compound selected from the group consisting of drilling fluid, HMP, cement, gas, oil, water, proppant, fracturing fluid, gelling agents, friction reducers, acidizers, conformance fluids, cleaning fluids, brine, cutting abrasives and combinations thereof.

6. (Original) The method of claim 1, further comprising the steps of:

receiving a production fluid at one or more of the one or more centralized service factories from the at least one of the plurality of wells, wherein the one or more of the one or more centralized service factories is configurable to receive the production fluid; and

receiving the production fluid at the centralized well treatment fluid center from the one or more of the one or more centralized service factories, wherein the centralized well treatment fluid center is configurable to receive the production fluid from the one or more of the one or more centralized service factories.

7. (Currently Amended) The method of claim 6, further comprising the step[[s]] of:

separating the production fluid into at least two or more second production fluids, wherein the centralized well treatment fluid center is configurable to separate the production fluid into at least two or more second production fluids.

8. (Original) The method of claim 7, further comprising the steps of:

conditioning the at least two or more second production fluids, wherein the centralized well treatment fluid center is configurable to condition the at least two or more second production fluids; and

disposing of at least one of the at least two or more second production fluids, wherein the centralized well treatment fluid center is configurable to dispose of the at least one of the at least two or more second production fluids.

9. (Original) The method of claim 7, further comprising:

flowing the at least two or more second production fluids to a distribution center, wherein the centralized well treatment fluid center is configurable to flow the at least two or more second production fluids to the distribution center.

10. (Original) The method of claim 1, further comprising the steps of:

flowing from the centralized well treatment fluid center to the one or more centralized service factories one or more other well development task fluids, wherein the one or more centralized service factories are selectively configurable to receive the one or more other well development task fluids;

flowing from the one or more centralized service factories to the at least one of the plurality of wells the one or more other well treatment fluids, wherein the one or more centralized service factories is selectively configurable to flow the one or more other well treatment fluids;

recovering from the at least one of the plurality of wells the one or more other well treatment fluids at the one or more centralized service factories, wherein the one or more centralized service factories are selectively configurable to receive the one or more recovered other well treatment fluids; and

flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more other recovered well treatment fluids, wherein the one or more centralized service factories are selectively configurable to flow the one or more other recovered well treatment fluids, and wherein the centralized well treat fluid center is selectively configurable to receive the one or more other recovered well treatment fluids.

11. (Currently Amended) The method of claim 1, further comprising the step[[s]] of:

storing the one or more recovered well treatment fluids at the centralized well treatment fluid center, wherein the centralized well treatment fluid center is configurable to store the one or more recovered well treatment fluids.

12. (Currently Amended) The method of claim 1, further comprising the step[[s]] of:

flowing from the centralized well treatment fluid center substantially simultaneously two or more well development task fluids to at least one of the one or more centralized service factories, wherein the centralized well treatment fluid center is configurable to flow substantially simultaneously the two or more well development task fluids, and wherein the at least one of the one or more centralized service factories are configurable to receive substantially simultaneously the two or more well development task fluids.

13. (Currently Amended) The method of claim 12, further comprising the step[[s]] of:

flowing to a first well of the plurality of wells from the at least one of the one or more centralized service factories any of the one or more well treatment fluids prepared from the two or more well development task fluids substantially simultaneously with flowing to a second well of the plurality of wells from the at least one of the one or more centralized service factories any of the one or more well treatment fluids prepared from the two or more well development task fluids, wherein the at least one of the one or more centralized service factories is configurable to flow substantially simultaneously at least two of the one or more well treatment fluids.

14. (Currently Amended) The method of claim 1, further comprising the step[[s]] of:  
flowing from the centralized well treatment fluid center to the one or more centralized service factories the one or more well treatment fluids, wherein the one or more centralized service factories are selectively configurable to receive the one or more well treatment fluids.

15. (Currently Amended) The method of claim 1, further comprising the steps of:  
flowing to two or more wells of the plurality of wells substantially simultaneously the one or more well treatment fluids from at least one of the one or more centralized service factories, wherein the at least one of the one or more centralized service factories is configurable to flow substantially simultaneously the one or more well treatment fluids to the two or more wells of the plurality of wells; and

recovering from the two or more wells of the plurality of wells substantially simultaneously the one or more well treatment fluids at the at least one of the one or more centralized service factories, wherein the at least one of the one or more centralized service

factories is configured to recover substantially simultaneously the one or more well treatment fluids.

16. (Original) The method of claim 1, further comprising the steps of:

providing a first plurality of fluid lines from the centralized well treatment fluid center to a first centralized service factory, wherein the first plurality of fluid lines are adapted to flow the one or more well treatment fluids;

providing a second plurality of fluid lines from the centralized well treatment fluid center to the first centralized service factory, wherein the second plurality of fluid lines are adapted to flow the one or more recovered well treatment fluids;

providing a third plurality of fluid lines from the centralized well treatment fluid center to a second centralized service factory, wherein the third plurality of fluid lines are adapted to flow the one or more well treatment fluids; and

providing a fourth plurality of fluid lines from the centralized well treatment fluid center to the second centralized service factory, wherein the fourth plurality of fluid lines are adapted to flow the one or more recovered well treatment fluids.

17. (Currently Amended) A system for centralized distributing, receiving, and treating fluids for a plurality of wells, the system comprising:

a centralized well treatment fluid center;

one or more centralized service factories;

a plurality of distribution lines coupled between the centralized well treatment fluid center and the one or more centralized service factories, wherein the plurality of distribution lines are adapted to flow one or more well development task fluids; and

a plurality of return lines coupled between the centralized well treatment fluid center and the one or more centralized service factories, wherein the plurality of return lines are adapted to flow one or more recovered well treatment fluids.

18. (Currently Amended) The system of claim 17, further comprising:

a plurality of modules disposed about each of the one or more centralized service factories;

a first fluid flow line coupled between the at least one of the plurality of wells and any of the plurality of modules, wherein the first fluid flow line is adapted to flow one or more well treatment fluids to the at least one of the plurality of wells; and

a second fluid flow line coupled between the at least one of the plurality of wells and one or more of the plurality of modules, wherein the second fluid flow line is adapted to recover the one or more well treatment fluids from the at least one of the plurality of wells;

wherein a first configuration of the plurality of modules is operable to flow a first well treatment fluid to the at least one of the plurality of wells; and

wherein a second configuration of the plurality of modules is operable to flow a second well treatment fluid to the at least one of the plurality of wells.

19. (Original) The system of claim 17, wherein each of the plurality of distribution lines are adapted to flow one or more well treatment fluids.

20. (Original) The system of claim 17, wherein the centralized well treatment center is configurable to:

- flow the one or more well development task fluids;
- receive the one or more recovered well treatment fluids;
- recondition the one or more recovered well treatment fluids; and
- receive production fluids.

21. (Original) The system of claim 17, wherein the one or more centralized service factories is configurable to:

- receive the one or more well development task fluids from the centralized well treatment fluid center;

- prepare the one or more well treatment fluids from the one or more well development task fluids;

- flow the one or more well treatment fluids to the plurality of wells;
- receive the one or more recovered well treatment fluids from the plurality of wells; and

- receive production fluids from the plurality of wells.

22. (Original) The system of claim 17, wherein the plurality of modules comprise:  
one or more blending modules;

one or more additive storage modules, wherein the one or more additive storage modules are operable to connect to the one or more blending modules;

one or more liquid additive pumps, wherein the one or more liquid additive pumps are operable to connect to the one or more blending modules;

one or more pumping grids, wherein the one or more pumping grids are operable to connect to the one or more blending modules;

one or more manifolds, wherein the one or more manifolds are operable to connect to the one or more blending modules; and

a power grid, wherein the power grid is operable to connect to the one or more blending modules, the one or more additive storage modules, the one or more liquid additive pumps, the one or more pumping grids, and the one or more manifolds.

23. (Original) The system of claim 22, further comprising:

a third fluid flow line between at least one of a second plurality of wells and the one or more manifolds, wherein the third fluid flow line is directed to delivering at least one of the one or more well treatment fluids;

wherein the one or more manifolds is operable to deliver substantially simultaneously any of the one or more well treatment fluids through the third fluid flow line and any of the one or more well treatment fluids through the second fluid flow line; and

a fourth fluid flow line between the second plurality of wells and the one or more manifolds, wherein the fourth fluid flow line is directed to recovering the one or more well treatment fluids from the at least one of the second plurality of wells.

24. (Original) The system of claim 18, wherein at least one of the one or more modules is directed to reconditioning the one or more well treatment fluids substantially simultaneously with recovering the one or more well treatment fluids.

25. (Original) The system of claim 18, further comprising:

a fluid reconditioning module disposed about the centralized well treatment fluid center, wherein the fluid reconditioning module is operable to recondition at least one of the one or more recovered well treatment fluids; and

a fifth fluid flow line between the fluid reconditioning module and the third fluid flow line so as to receive the one or more recovered well treatment fluids from the at least one of the one or more centralized service factories.

26. (Original) The system of claim 25, further comprising:

a sixth fluid flow line between the fluid reconditioning module and any of the one or more modules so as to flow the reconditioned well treatment fluids to the one or more centralized service factories.

27. (Original) The system of claim 26, further comprising:

a seventh fluid flow line between the fluid reconditioning module and an additive storage module, wherein the additive storage module is operable to store the reconditioned well treatment fluids.

28. (Original) The system of claim 18, further comprising a disposal module coupled to at least one of the one or more modules, wherein the disposal module is operable to dispose of the recovered well treatment fluids.

29. (Original) The system of claim 18, further comprising a base coupled to at least one of the one or more modules, wherein the base is operable to move the at least one of the one or more modules.

30. (Original) The system of claim 18, further comprising a cleaning module coupled to at least one of the one or more modules, wherein the cleaning module is operable to clean any fluid flow line.

31. (Original) The system of claim 18, further comprising a production fluid module, wherein the production fluid module is operable to receive production fluid from at least one of the one or more centralized service factories.

## **REMARKS / ARGUMENTS**

### **I. General Remarks and Disposition of the Claims**

Please consider the application in view of the following remarks. Applicants thank the Examiner for her careful consideration of this application.

At the time of the Office Action, claims 1-31 were pending in this application. Claims 1-31 were rejected in the Office Action. By this paper, claims 2-4, 7, 11-15, 17, and 18 have been amended. All the amendments are made in a good faith effort to advance the prosecution on the merits of this case. It should not be assumed that the amendments made herein were made for reasons related to patentability. Applicants respectfully request that the above amendments be entered and further request reconsideration in light of the amendments and remarks contained herein.

### **II. Remarks Regarding Objections to the Specification**

With respect to this objection, the Office Action states:

The abstract of the disclosure is objected to because the term "is disclosed" is stated in lines 1 and 6. Correction is required. See MPEP § 608.01(b).

(Office Action at 2.) Although Applicants do not necessarily agree with this objection, Applicants have amended the abstract to delete the terms "is disclosed." Therefore, Applicants respectfully request the withdrawal of this objection.

### **III. Remarks Regarding Rejections Under 35 U.S.C. § 102**

#### **A. Rejections over U.S. Patent No. 4,305,463**

Claims 1-31 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,305,463 issued to Zakiewicz (hereinafter "*Zakiewicz*"). With respect to this rejection, the Office Action states:

With respect to at least claim 1, ZAKIEWICZ discloses a system for centralized well operations comprising a well treatment operations factory which manufactures and pumps a well stimulation fluid, a first connection between a first well location and the well operations factory, a second connection between a second well location and the well operations factory and means for simultaneously flowing a first stimulation fluid to the first well location and a second stimulation fluid to a second well location (column 4, lines 12-68 and Figure 1). With respect to the depending claims, the reference discloses that the means for simultaneously flowing treatment fluid comprises a manifold

(Figure 1, items 9,10,11,12,13,14,21 wherein item 9 represents the first connection and location and item 10 represents the second connection and location), that the well operations factory comprises a pumping grid wherein the pumping grid is operable to connect to the manifold, that the first connection is operable to deliver a fluid from the first well location to the manifold, that the second connection is operable to deliver a fluid from the second well location to the manifold, that the fluid comprises a stimulation fluid, that the manifold is connected to a second manifold, that the second manifold is operable to simultaneously flow a first stimulation fluid to a first well location and a second stimulation fluid to a second well location, a third connection between the manifold and the first well location, that the third connection is operable to deliver a fluid from the first well location to the manifold, that there is a fourth connection between the manifold and the second well location, wherein the fourth connection is operable to deliver a fluid from the second well location to the manifold, that the first fluid comprises a compound selected from the group as claimed, and that the first stimulation fluid and the second stimulation fluid have the same composition. With respect to claims 17-31, the reference discloses a system for centralized well operations comprising a well treatment operations factory which manufactures and pumps a well stimulation fluid, connections between the first pad and second pad and the well operations factory, and means for simultaneously flowing a first stimulation fluid to the first pad and second stimulation fluid to the second pad.

(Office Action at 2-3.) Applicants respectfully disagree. Applicants respectfully submit that the cited reference does not disclose each and every limitation of claims 1-31, as required to anticipate these claims under 35 U.S.C. § 102(b). *See* MPEP § 2131.

In particular, with respect to independent claim 1, *Zakiewicz* fails to disclose a method comprising the steps of: “flowing from a centralized well treatment fluid center to one or more centralized service factories one or more well development task fluids,” “preparing, at the one or more centralized service factories, one or more well treatment fluids from the one or more well development task fluids,” “flowing from the one or more centralized service factories to at least one of the plurality of wells the one or more well treatment fluids,” “recovering from the at least one of the plurality of wells the one or more well treatment fluids at the one or more centralized service factories,” and “flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more recovered well treatment fluids.” Rather than disclosing such a method, *Zakiewicz* discloses the injection of a brine into a

subterranean formation, the recovery of a fluid the subterranean formation, the separation of a brine from that fluid, and the recirculation of the brine into the subterranean formation. *See Zakiewicz*, col. 4 lines 12-68. There is no disclosure in *Zakiewicz* of flowing from a centralized well treatment fluid center to one or more centralized services factories one or more well development task fluids or flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more recovered well treatment fluids. Thus, *Zakiewicz* fails to anticipate each and every element of this claim.

Furthermore, with respect to independent claims 1 and 17, Applicants respectfully submit *Zakiewicz* fails to disclose a centralized well treatment fluid center. Applicants note that although the Examiner alleges *Zakiewicz* discloses a “well treatment operations factory which manufactures and pumps a well stimulation fluid” (and is presumably correlating this with Applicants’ claimed centralized service factory), the Examiner has failed to even allege that *Zakiewicz* discloses a centralized well treatment fluid center. Applicants respectfully note that independent claims 1 and 17 each require a centralized well treatment fluid center. Furthermore, Applicants have thoroughly reviewed *Zakiewicz* and have found no disclosure of a centralized well treatment fluid center. Thus, *Zakiewicz* fails to disclose each and every element of these claims.

Therefore, Applicants respectfully assert that independent claims 1 and 17 and their dependent claims are not anticipated by *Zakiewicz*. Accordingly, Applicants respectfully request withdrawal of this rejection with respect to claims 1-31.

**B. Rejections over U.S. Patent No. 5,515,920**

Claims 1-31 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,515,920 issued to Luk *et al.* (hereinafter “*Luk*”). With respect to this rejection the Office Action states:

With respect to at least claim 1, LUK discloses a system for centralized well operations comprising a well treatment operations factory which manufactures and pumps a well stimulation fluid, a first connection between a first well location and the well operations factory, a second connection between a second well location and the well operations factory and means for simultaneously flowing a first stimulation fluid to the first well location and a second stimulation fluid to a second well location (abstract, Figure 6, column 6, lines 26-47). With respect to the depending claims, the reference discloses that the means for

simultaneously flowing treatment fluid comprises a manifold (column 4, lines 51-59 and #5), that the factory comprises a pumping grid wherein the grid is operable to connect to the manifold, that the factory comprises a blending unit wherein the blending unit is operable to connect to the pumping grid (#20 and #30 and #70), wherein the factory comprises a proppant storage system wherein the storage system is operable to deliver proppant to the blending unit (column 6, lines 42-47 and #80 which is the proppant storage which delivers proppant to the system), wherein the first connection is operable to deliver a fluid from the first well location to the manifold, wherein the second connection is operable to deliver a fluid from the second well location to the manifold, wherein the fluid comprises a stimulation fluid, wherein the manifold is connected to a second manifold (#40 and #5), wherein the second manifold is operable to simultaneously flow a first stimulation fluid to a first well location and a second stimulation fluid to a second well location, and wherein the first fluid comprises a compound selected from the groups as claimed (column 7, lines 21-26). With respect to claims 17-31, the reference discloses a system for centralized well operations comprising a well treatment operations factory which manufactures and pumps a well stimulation fluid, connections between the first pad and second pad and the well operations factory, and means for simultaneously flowing a first stimulation fluid to the first pad and second stimulation fluid to the second pad.

(Office Action at 3-4.) Applicants respectfully disagree. Applicants respectfully submit that the cited reference does not disclose each and every limitation of claims 1-31, as required to anticipate these claims under 35 U.S.C. § 102(b). *See* MPEP § 2131.

In particular, with respect to independent claim 1, *Luk* fails to disclose a method comprising the steps of: “flowing from a centralized well treatment fluid center to one or more centralized service factories one or more well development task fluids,” “preparing, at the one or more centralized service factories, one or more well treatment fluids from the one or more well development task fluids,” “flowing from the one or more centralized service factories to at least one of the plurality of wells the one or more well treatment fluids,” “recovering from the at least one of the plurality of wells the one or more well treatment fluids at the one or more centralized service factories,” and “flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more recovered well treatment fluids.” Rather than disclosing such a method, the portions of *Luk* cited by the Examiner disclose the injection of a fracturing fluid into a subterranean formation. *See Luk*, abstract, Figure 6, and col. 6 lines 26-

47. There is no disclosure in *Luk* of flowing from a centralized well treatment fluid center to one or more centralized services factories one or more well development task fluids or flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more recovered well treatment fluids . Thus, *Luk* fails to anticipate each and every element of this claim.

Furthermore, with respect to independent claims 1 and 17, Applicants respectfully submit *Luk* fails to disclose a centralized well treatment fluid center. Applicants note that although the Examiner alleges *Luk* discloses a “well treatment operations factory which manufactures and pumps a well stimulation fluid” (and is presumably correlating this with Applicants’ claimed centralized service factory), the Examiner has failed to even allege that *Luk* discloses a centralized well treatment fluid center. Applicants respectfully note that independent claims 1 and 17 each require a centralized well treatment fluid center. Furthermore, Applicants have thoroughly reviewed *Luk* and have found no disclosure of a centralized well treatment fluid center. Thus, *Luk* fails to disclose each and every element of these claims.

Therefore, Applicants respectfully assert that independent claims 1 and 17 and their dependent claims are not anticipated by *Luk*. Accordingly, Applicants respectfully request withdrawal of this rejection with respect to claims 1-31.

#### **IV. No Waiver**

All of Applicants’ arguments and amendments are without prejudice or disclaimer. Additionally, Applicants have merely discussed example distinctions from the cited references. Other distinctions may exist, and Applicants reserve the right to discuss these additional distinctions in a later Response or on Appeal, if appropriate. By not responding to additional statements made by the Examiner, Applicants do not acquiesce to the Examiner’s additional statements, such as, for example, any statements relating to what would be obvious to a person of ordinary skill in the art.

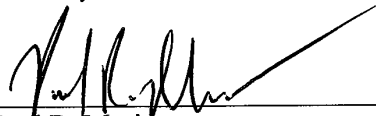
#### **SUMMARY**

In light of the above amendments and remarks, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections. Applicants further submit that the application is now in condition for allowance, and earnestly solicit timely notice of the same. Should the Examiner have any questions, comments or suggestions in furtherance of the

prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

Applicants believe that no fees are due in association with the filing of this response. Should the Commissioner deem that any fees are due, including any fees for extensions of time, Applicants respectfully request that the Commissioner accept this as a Petition Therefor, and direct that any additional fees be charged to Baker Botts, L.L.P.'s Deposit Account No. 02-0383, Order Number 063718.1162.

Respectfully submitted,

By: 

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Date: December 23, 2008

| Electronic Acknowledgement Receipt   |                                                  |
|--------------------------------------|--------------------------------------------------|
| EFS ID:                              | 4509917                                          |
| Application Number:                  | 11873186                                         |
| International Application Number:    |                                                  |
| Confirmation Number:                 | 1172                                             |
| Title of Invention:                  | Method and System for Centralized Well Treatment |
| First Named Inventor/Applicant Name: | Jim B. Surjaatmadja                              |
| Customer Number:                     | 29920                                            |
| Filer:                               | Paul N. Katz/Debbie Allen                        |
| Filer Authorized By:                 | Paul N. Katz                                     |
| Attorney Docket Number:              | 2006-IP-021186U1                                 |
| Receipt Date:                        | 23-DEC-2008                                      |
| Filing Date:                         | 16-OCT-2007                                      |
| Time Stamp:                          | 11:06:22                                         |
| Application Type:                    | Utility under 35 USC 111(a)                      |

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### File Listing:

| Document Number | Document Description | File Name         | File Size(Bytes)/<br>Message Digest          | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------|----------------------------------------------|------------------|------------------|
| 1               |                      | 0637181162ROA.PDF | 807632                                       | yes              | 16               |
|                 |                      |                   | f38d9a1d244a96a6c010222c5aa07ff0914e<br>dedb |                  |                  |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Document Description                                  | Start  | End |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Amendment/Req. Reconsideration-After Non-Final Reject | 1      | 1   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Specification                                         | 2      | 2   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Claims                                                | 3      | 10  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Applicant Arguments/Remarks Made in an Amendment      | 11     | 16  |
| Warnings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                       |        |     |
| Information:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                       |        |     |
| Total Files Size (in bytes):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                       | 807632 |     |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                       |        |     |

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| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               |                                    |                                    |               | Application or Docket Number<br><b>11/873,186</b> |                                          | Filing Date<br><b>10/16/2007</b> |                         | <input checked="" type="checkbox"/> To be Mailed |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------|---------------|---------------------------------------------------|------------------------------------------|----------------------------------|-------------------------|--------------------------------------------------|--|
| <b>APPLICATION AS FILED – PART I</b>                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               |                                    | (Column 2)                         |               |                                                   | SMALL ENTITY <input type="checkbox"/> OR |                                  | OTHER THAN SMALL ENTITY |                                                  |  |
| FOR                                                                                                                                                                                                                                                                                                                                                                                                               | NUMBER FILED                                                                                                                                                                                                                  | NUMBER EXTRA                       | RATE (\$)                          | FEE (\$)      | OR                                                | RATE (\$)                                | FEE (\$)                         |                         |                                                  |  |
| <input type="checkbox"/> BASIC FEE<br>(37 CFR 1.16(a), (b), or (c))                                                                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                           | N/A                                | N/A                                |               |                                                   | N/A                                      |                                  |                         |                                                  |  |
| <input type="checkbox"/> SEARCH FEE<br>(37 CFR 1.16(k), (i), or (m))                                                                                                                                                                                                                                                                                                                                              | N/A                                                                                                                                                                                                                           | N/A                                | N/A                                |               |                                                   | N/A                                      |                                  |                         |                                                  |  |
| <input type="checkbox"/> EXAMINATION FEE<br>(37 CFR 1.16(o), (p), or (q))                                                                                                                                                                                                                                                                                                                                         | N/A                                                                                                                                                                                                                           | N/A                                | N/A                                |               |                                                   | N/A                                      |                                  |                         |                                                  |  |
| TOTAL CLAIMS<br>(37 CFR 1.16(i))                                                                                                                                                                                                                                                                                                                                                                                  | minus 20 =                                                                                                                                                                                                                    | *                                  | X \$ =                             |               | OR                                                | X \$ =                                   |                                  |                         |                                                  |  |
| INDEPENDENT CLAIMS<br>(37 CFR 1.16(h))                                                                                                                                                                                                                                                                                                                                                                            | minus 3 =                                                                                                                                                                                                                     | *                                  | X \$ =                             |               |                                                   | X \$ =                                   |                                  |                         |                                                  |  |
| <input type="checkbox"/> APPLICATION SIZE FEE<br>(37 CFR 1.16(s))                                                                                                                                                                                                                                                                                                                                                 | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
| * If the difference in column 1 is less than zero, enter "0" in column 2.                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
| <b>APPLICATION AS AMENDED – PART II</b>                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               |                                    | (Column 2)                         |               |                                                   | SMALL ENTITY OR                          |                                  | OTHER THAN SMALL ENTITY |                                                  |  |
| AMENDMENT                                                                                                                                                                                                                                                                                                                                                                                                         | 12/23/2008                                                                                                                                                                                                                    | CLAIMS REMAINING AFTER AMENDMENT   | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$)                                         | ADDITIONAL FEE (\$)                      | OR                               | RATE (\$)               | ADDITIONAL FEE (\$)                              |  |
| Total (37 CFR 1.16(o))                                                                                                                                                                                                                                                                                                                                                                                            | * 31                                                                                                                                                                                                                          | Minus                              | ** 31                              | = 0           | X \$ =                                            |                                          | OR                               | X \$52=                 | 0                                                |  |
| Independent (37 CFR 1.16(h))                                                                                                                                                                                                                                                                                                                                                                                      | * 2                                                                                                                                                                                                                           | Minus                              | ***3                               | = 0           | X \$ =                                            |                                          | OR                               | X \$220=                | 0                                                |  |
| <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
| <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                               |                                    |                                    |               | TOTAL ADD'L FEE                                   |                                          | OR                               | TOTAL ADD'L FEE         | 0                                                |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                               |                                    | (Column 2)                         |               |                                                   | SMALL ENTITY OR                          |                                  | OTHER THAN SMALL ENTITY |                                                  |  |
| AMENDMENT                                                                                                                                                                                                                                                                                                                                                                                                         | CLAIMS REMAINING AFTER AMENDMENT                                                                                                                                                                                              | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA                      | RATE (\$)     | ADDITIONAL FEE (\$)                               | OR                                       | RATE (\$)                        | ADDITIONAL FEE (\$)     |                                                  |  |
| Total (37 CFR 1.16(o))                                                                                                                                                                                                                                                                                                                                                                                            | *                                                                                                                                                                                                                             | Minus                              | **                                 | =             | X \$ =                                            |                                          | OR                               | X \$ =                  |                                                  |  |
| Independent (37 CFR 1.16(h))                                                                                                                                                                                                                                                                                                                                                                                      | *                                                                                                                                                                                                                             | Minus                              | ***                                | =             | X \$ =                                            |                                          | OR                               | X \$ =                  |                                                  |  |
| <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
| <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                               |                                    |                                    |               | TOTAL ADD'L FEE                                   |                                          | OR                               | TOTAL ADD'L FEE         |                                                  |  |
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.<br>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".<br>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".<br>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1. |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                                  |  |

Legal Instrument Examiner:  
/NICHELE PETERSON/

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                      | 11873186   |
|                                                                                                     | Filing Date            |                      | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |
|                                                                                                     | Art Unit               | 3676                 |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

| U.S.PATENTS       |         |               |                        |            |                                                 |                                                                          |
|-------------------|---------|---------------|------------------------|------------|-------------------------------------------------|--------------------------------------------------------------------------|
| Examiner Initial* | Cite No | Patent Number | Kind Code <sup>1</sup> | Issue Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
|                   | 1       | 2953460       |                        | 1960-09-20 | Baker, John C.                                  |                                                                          |
|                   | 2       | 2980291       |                        | 1961-04-18 | Schuerger, Thomas R.                            |                                                                          |
|                   | 3       | 4410106       |                        | 1983-10-18 | Kierbow, et al.                                 |                                                                          |
|                   | 4       | 4427133       |                        | 1984-01-24 | Kierbow, et al.                                 |                                                                          |
|                   | 5       | 4701095       |                        | 1987-10-20 | Berryman, et al.                                |                                                                          |
|                   | 6       | 4850750       |                        | 1989-07-25 | Cogbill, et al.                                 |                                                                          |
|                   | 7       | 5245548       |                        | 1993-09-14 | Kuan                                            |                                                                          |
|                   | 8       | 6120175       |                        | 2000-09-19 | Tewell                                          |                                                                          |

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                      | 11873186   |
|                                                                                                     | Filing Date            |                      | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |
|                                                                                                     | Art Unit               | 3676                 |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

| U.S.PATENT APPLICATION PUBLICATIONS |         |                    |                        |                  |                                                 |                                                                          |
|-------------------------------------|---------|--------------------|------------------------|------------------|-------------------------------------------------|--------------------------------------------------------------------------|
| Examiner Initial*                   | Cite No | Publication Number | Kind Code <sup>1</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
|                                     | 1       |                    |                        |                  |                                                 |                                                                          |

If you wish to add additional U.S. Published Application citation information please click the Add button.

| FOREIGN PATENT DOCUMENTS |         |                                      |                           |                        |                  |                                                 |                                                                          |                          |
|--------------------------|---------|--------------------------------------|---------------------------|------------------------|------------------|-------------------------------------------------|--------------------------------------------------------------------------|--------------------------|
| Examiner Initial*        | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|                          | 1       |                                      |                           |                        |                  |                                                 |                                                                          | <input type="checkbox"/> |

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| NON-PATENT LITERATURE DOCUMENTS |         |                                                                                                                                                                                                                                                                 |                          |
|---------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Examiner Initials*              | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>5</sup>           |
|                                 | 1       | Office Action for U.S. Serial No. 11/363,559 mailed 1/23/09                                                                                                                                                                                                     | <input type="checkbox"/> |

If you wish to add additional non-patent literature document citation information please click the Add button

| EXAMINER SIGNATURE |  |                 |  |
|--------------------|--|-----------------|--|
| Examiner Signature |  | Date Considered |  |

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

|                        |                      |
|------------------------|----------------------|
| Application Number     | 11873186             |
| Filing Date            | 2007-10-16           |
| First Named Inventor   | Surjaatmadja         |
| Art Unit               | 3676                 |
| Examiner Name          | Bates, Zakiya W.     |
| Attorney Docket Number | HES 2006-IP-021186U1 |

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

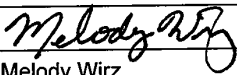
**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-02-02 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Acknowledgement Receipt          |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <b>EFS ID:</b>                              | 4713864                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Paul N. Katz/Debbie Allen                        |
| <b>Filer Authorized By:</b>                 | Paul N. Katz                                     |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 02-FEB-2009                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 07:49:09                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

### Payment information:

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

### File Listing:

| Document Number | Document Description | File Name         | File Size(Bytes)/<br>Message Digest      | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------|------------------------------------------|------------------|------------------|
| 1               |                      | 0637181162IDS.PDF | 544348                                   | yes              | 14               |
|                 |                      |                   | a71a2585271e776ef5f54f000d69520458ecdd68 |                  |                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Multipart Description/PDF files in .zip description  |        |     |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Document Description                                 | Start  | End |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Information Disclosure Statement (IDS) Filed (SB/08) | 1      | 3   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | NPL Documents                                        | 4      | 14  |
| Warnings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      |        |     |
| Information:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |        |     |
| Total Files Size (in bytes):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      | 544348 |     |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                      |        |     |

|                                                                                                     |                        |                      |            |
|-----------------------------------------------------------------------------------------------------|------------------------|----------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                      | 11873186   |
|                                                                                                     | Filing Date            |                      | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |
|                                                                                                     | Art Unit               | 3676                 |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

| U.S.PATENTS       |         |               |                        |            |                                                 |                                                                        |
|-------------------|---------|---------------|------------------------|------------|-------------------------------------------------|------------------------------------------------------------------------|
| Examiner Initial* | Cite No | Patent Number | Kind Code <sup>1</sup> | Issue Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|                   | 1       |               |                        |            |                                                 |                                                                        |

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| U.S.PATENT APPLICATION PUBLICATIONS |         |                    |                        |                  |                                                 |                                                                        |
|-------------------------------------|---------|--------------------|------------------------|------------------|-------------------------------------------------|------------------------------------------------------------------------|
| Examiner Initial*                   | Cite No | Publication Number | Kind Code <sup>1</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|                                     | 1       |                    |                        |                  |                                                 |                                                                        |

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| FOREIGN PATENT DOCUMENTS |         |                                      |                            |                        |                  |                                                 |                                                                        |                          |
|--------------------------|---------|--------------------------------------|----------------------------|------------------------|------------------|-------------------------------------------------|------------------------------------------------------------------------|--------------------------|
| Examiner Initial*        | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2i</sup> | Kind Code <sup>4</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|                          | 1       |                                      |                            |                        |                  |                                                 |                                                                        | <input type="checkbox"/> |

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| NON-PATENT LITERATURE DOCUMENTS |         |                                                                                                                                                                                                                                                                 |                |
|---------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Examiner Initials*              | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>5</sup> |
|                                 |         |                                                                                                                                                                                                                                                                 |                |

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|-----------------------------------------------------------------------------------------------------|------------------------|----------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                      | 11873186   |
|                                                                                                     | Filing Date            |                      | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |
|                                                                                                     | Art Unit               | 3676                 |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

|   |                                                                        |                          |
|---|------------------------------------------------------------------------|--------------------------|
| 1 | Office Action for U.S. Serial No. 11/545,749, mailed February 10, 2009 | <input type="checkbox"/> |
|---|------------------------------------------------------------------------|--------------------------|

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#### EXAMINER SIGNATURE

|                    |  |                 |  |
|--------------------|--|-----------------|--|
| Examiner Signature |  | Date Considered |  |
|--------------------|--|-----------------|--|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

|                        |                      |
|------------------------|----------------------|
| Application Number     | 11873186             |
| Filing Date            | 2007-10-16           |
| First Named Inventor   | Surjaatmadja         |
| Art Unit               | 3676                 |
| Examiner Name          | Bates, Zakiya W.     |
| Attorney Docket Number | HES 2006-IP-021186U1 |

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-02-19 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Acknowledgement Receipt   |                                                  |
|--------------------------------------|--------------------------------------------------|
| EFS ID:                              | 4820354                                          |
| Application Number:                  | 11873186                                         |
| International Application Number:    |                                                  |
| Confirmation Number:                 | 1172                                             |
| Title of Invention:                  | Method and System for Centralized Well Treatment |
| First Named Inventor/Applicant Name: | Jim B. Surjaatmadja                              |
| Customer Number:                     | 29920                                            |
| Filer:                               | Paul N. Katz/Debbie Allen                        |
| Filer Authorized By:                 | Paul N. Katz                                     |
| Attorney Docket Number:              | 2006-IP-021186U1                                 |
| Receipt Date:                        | 19-FEB-2009                                      |
| Filing Date:                         | 16-OCT-2007                                      |
| Time Stamp:                          | 12:52:24                                         |
| Application Type:                    | Utility under 35 USC 111(a)                      |

### Payment information:

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|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

### File Listing:

| Document Number | Document Description | File Name         | File Size(Bytes)/<br>Message Digest      | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------|------------------------------------------|------------------|------------------|
| 1               |                      | 0637181162IDS.PDF | 321005                                   | yes              | 8                |
|                 |                      |                   | 783e40cde8535fe9d579bf8d517d458a659d17e4 |                  |                  |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Information Disclosure Statement (IDS) Filed (SB/08) | 1      | 3   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | NPL Documents                                        | 4      | 8   |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                      |        |     |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                      |        |     |
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| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                      |        |     |



# UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office  
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www.uspto.gov

| APPLICATION NO.                                                                  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.             | CONFIRMATION NO.            |
|----------------------------------------------------------------------------------|-------------|----------------------|---------------------------------|-----------------------------|
| 11/873,186                                                                       | 10/16/2007  | Jim B. Surjaatmadja  | 2006-IP-021186U1                | 1172                        |
| 29920 7590 03/23/2009<br>JOHN W. WUSTENBERG<br>P.O. BOX 1431<br>DUNCAN, OK 73536 |             |                      | EXAMINER<br>BATES, ZAKIYA W     |                             |
|                                                                                  |             |                      | ART UNIT<br>3676                | PAPER NUMBER                |
|                                                                                  |             |                      | NOTIFICATION DATE<br>03/23/2009 | DELIVERY MODE<br>ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JOHN.WUSTENBERG@HALLIBURTON.COM  
CHASIDY.SMITH@HALLIBURTON.COM

|                              |                        |                      |  |
|------------------------------|------------------------|----------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b>  |  |
|                              | 11/873,186             | SURJAATMADJA, JIM B. |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>      |  |
|                              | /Zakiya W. Bates/      | 3676                 |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on 23 December 2008.

2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 1-31 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1-31 is/are rejected.

7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All    b) ☐ Some \*    c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.

4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Tolman et al. (WO 2007/024383) (or US equivalent 2006028608).

With respect to system claims 17-31, the reference discloses a system for centralized well operations comprising: a well treatment operations factory which manufactures and pumps a well stimulation fluid; a first connection between a first well location and the well operations factory; a second connection between a second well location and the well operations factory; and means for simultaneously flowing: a first stimulation fluid to the first well location and not to the second well location; and a second stimulation fluid to the second well location and not to the first well location (see esp. [0012]; [0018]-[0041]; [0067]).

With respect to depending claims, the reference teaches: wherein the means for

simultaneously flowing treatment fluid comprises a manifold ([0067]); wherein the well operations factory comprises a pumping grid operable to connect to the manifold ([0020]; [0030]-[0031]); wherein the first connection is operable to deliver a fluid from the first well location to the manifold, wherein the second connection is operable to deliver a fluid from the second well location to the manifold, and wherein the fluid comprises a stimulation fluid ([0031]; [0035]-[0039]); wherein the manifold is connected to a second manifold, and, further, wherein the second manifold is operable to simultaneously flow a first stimulation fluid to a first well location and a second stimulation fluid to a second well location ([0067]); a third connection between the manifold and the first well location, wherein the third connection is operable to deliver a fluid from the first well location to the manifold; a fourth connection between the manifold and the second well location, and, further, wherein the fourth connection is operable to deliver a fluid from the second well location to the manifold ([0027]-[0032]; [0067]); wherein the first fluid comprises at least one component selected from the group as claimed, wherein the second stimulation comprises at least one compound selected from the group as claimed, and wherein the first stimulation fluid and the second stimulation fluid have the same composition ([0012]; [0065]; [0067]); wherein the well locations are pads and wherein the well treatment operations factory dynamically manufactures and pumps a well stimulation fluid ([0067]); a system for centralized well operations comprising: a well treatment operations factory which manufactures and pumps a well stimulation fluid; a first connection between a first pad and the well operations factory; a second connection between a second pad and the well operations

factory; and means for simultaneously flowing: a first stimulation fluid to the first pad and not to the second pad; and a second stimulation fluid to the second pad and not to the first pad (see esp. [0012]; [0018]-[0041]; [0067]); a system for centralized well operations comprising: a well treatment operations factory which dynamically manufactures and pumps a well stimulation fluid; a first connection between a first well location and the well operations factory; a second connection between a second well location and the well operations factory; and means for simultaneously flowing: a first stimulation fluid to the first well location and not to the second well location; and a second stimulation fluid to the second well location and not to the first well location (see esp. [0012]; [0018]-[0041]; [0067]); a system for centralized well operations comprising: a well treatment operations factory which manufactures and pumps a well stimulation fluid; a first connection between a first well location having a first plurality of wells and the operations factory; a second connection between a second well location having a second plurality of wells and the well operations factory; and means for simultaneously flowing: a first stimulation fluid to the first well location and not to the second well location; and stimulation fluid to the second well location and not to the first (see esp. [0012]; [0018]-[0041]; [0067]). With respect to method claims 1-16, the reference teaches the associated method.

### ***Response to Arguments***

3. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Although, the rejections made above are

not identical to the claim language of the instant invention, the rejections were made using more narrow terminology consistent with the scope of the broader claim language of the instant invention.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to /Zakiya W. Bates/ whose telephone number is (571) 272-7039. The examiner can normally be reached on Monday-Friday, 8:30 AM-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Gay can be reached on (571) 272-7029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zakiya W. Bates/  
Primary Examiner  
Art Unit 3676

Application/Control Number: 11/873,186  
Art Unit: 3676

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|-----------------------------------|---------------------------------------|--------------------------------------------------------------------|-------------|
| <b>Notice of References Cited</b> | Application/Control No.<br>11/873,186 | Applicant(s)/Patent Under<br>Reexamination<br>SURJAATMADJA, JIM B. |             |
|                                   | Examiner<br>/Zakiya W. Bates/         | Art Unit<br>3676                                                   | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * |   | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Name | Classification |
|---|---|--------------------------------------------------|-----------------|------|----------------|
|   | A | US-                                              |                 |      |                |
|   | B | US-                                              |                 |      |                |
|   | C | US-                                              |                 |      |                |
|   | D | US-                                              |                 |      |                |
|   | E | US-                                              |                 |      |                |
|   | F | US-                                              |                 |      |                |
|   | G | US-                                              |                 |      |                |
|   | H | US-                                              |                 |      |                |
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|   | J | US-                                              |                 |      |                |
|   | K | US-                                              |                 |      |                |
|   | L | US-                                              |                 |      |                |
|   | M | US-                                              |                 |      |                |

**FOREIGN PATENT DOCUMENTS**

| * |   | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Country | Name | Classification |
|---|---|--------------------------------------------------|-----------------|---------|------|----------------|
|   | N | 2007/024383                                      | 03-2007         | WIPO    |      |                |
|   | O |                                                  |                 |         |      |                |
|   | P |                                                  |                 |         |      |                |
|   | Q |                                                  |                 |         |      |                |
|   | R |                                                  |                 |         |      |                |
|   | S |                                                  |                 |         |      |                |
|   | T |                                                  |                 |         |      |                |

**NON-PATENT DOCUMENTS**

| * |   | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
|---|---|-------------------------------------------------------------------------------------------|
|   | U |                                                                                           |
|   | V |                                                                                           |
|   | W |                                                                                           |
|   | X |                                                                                           |

\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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(43) International Publication Date  
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**Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

**Published:**

- without international search report and to be republished upon receipt of that report

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

(54) Title: METHOD AND APPARATUS ASSOCIATED WITH STIMULATION TREATMENTS FOR WELLS

(57) Abstract: A method and apparatus associated with the production of hydrocarbons. In one embodiment, the method describes connecting multiple wells to a stimulation fluid pumping system via a pumping system manifold. The pumping system manifold is adjusted to provide a first well flow path from the stimulation fluid pumping system to a first well. Then, a first stimulation treatment is pumped into the first well. Concurrently with the pumping of the first stimulation treatment, a second well is prepared for a second stimulation treatment.

## METHOD AND APPARATUS ASSOCIATED WITH STIMULATION TREATMENTS FOR WELLS

### CROSS REFERENCE TO RELATED APPLICATIONS

**[0001]** This application claims the benefit of U.S. Provisional Application 60/709,586, filed 19 August, 2005.

### BACKGROUND

**[0002]** This section is intended to introduce the reader to various aspects of art, which may be associated with exemplary embodiments of the present techniques, which are described and/or claimed below. This discussion is believed to be helpful in providing the reader with information to facilitate a better understanding of particular aspects of the present techniques. Accordingly, it should be understood that these statements are to be read in this light, and not necessarily as admissions of prior art.

**[0003]** The production of hydrocarbons, such as oil and gas, has been performed for numerous years. To produce these hydrocarbons, one or more wells in a field are typically drilled to subsurface locations, which are generally referred to as subterranean formations, reservoirs or basins. The process of producing hydrocarbons from the subsurface formations typically involves drilling one or more wells to access the subsurface formations. With the wells drilled, completion and stimulation activities or operations may be utilized to produce the hydrocarbons, such as oil and gas, from the subsurface formations.

**[0004]** Because a single well may be utilized to access various regions of subsurface formations, drilling multiple wells from a single location, such as a surface pad or offshore platform, may be beneficial for certain applications. For example, in an offshore application, wells are routinely drilled from a single offshore platform due to the substantial platform installation and operational costs. Also, drilling of multiple wells from a single surface pad on land may reduce surface disturbance and environmental impact associated with well construction activities. Further, well construction activities for multiple wells at a single location may be effectively managed in the presence of surface constraints, such as topography, proximity to other buildings, and existing surface easements and right-of-ways. As such, wells

located on a single surface pad may be utilized to reduce costs and enhance operations.

**[0005]** Despite the benefits from having multiple wells at a single location, certain combinations of operations may be complicated, restricted, or prevented by the presence of multiple wells. That is, when performing completion operations on one of the wells, the operations performed on other wells may be limited. For instance, when stimulating a well on a surface pad having multiple wells, stimulation operations are typically performed on only the single well. When the well is being stimulated, equipment and personnel have to wait because the stimulation operations are performed in a sequential manner and initiation of additional wellbore preparation operations may be deferred until completion of the stimulation operations. As a result, equipment and personnel are not efficiently utilized at the surface pad.

**[0006]** Accordingly, the need exists for a method, apparatus and system for enhancing operations involving multiple wells on a surface pad to reduce the time and cost associated with stimulation treatments. In particular, there is a need for new apparatus, method, and system to enable reliable and cost-effective execution of concurrent or simultaneous wellbore preparation and stimulation operations in multiple wellbores located at a single surface location.

**[0007]** For additional information please reference Ammer et al., "Unconventional Gas: Reserve Opportunities and Technology Needs", GasTIPS, Fall 2004, pp. 22-26; U.S. Patent No. 5,890,536; U.S. Patent No. 6,186,230; U.S. Patent No. 6,394,184, U.S. Patent No. 6,520,255, U.S. Patent No. 6,543,538, U.S. Patent No. 6,575,247; U.S. Patent No. 6,672,405; U.S. Patent Publication No. 2003/0075335; and/or U.K. Patent No. 1,243,062; and/or U.K. Patent No. 2,028,400.

### **SUMMARY OF INVENTION**

**[0008]** In one embodiment, a method associated with the production of hydrocarbons is described. The method describes connecting multiple wells to a stimulation fluid pumping system via a pumping system manifold. The pumping system manifold is adjusted to provide a first well flow path from the stimulation fluid pumping system to a first well. Then, a first stimulation treatment is pumped into the first well. Concurrently with the pumping of the first stimulation treatment, a second well is prepared for a second stimulation treatment.

**[0009]** In an alternative embodiment, another method associated with the production of hydrocarbons is described. In this method, a plurality of wells is connected to a stimulation fluid pumping system via a pumping system manifold. Then, the pumping system manifold is adjusted to provide a stimulation treatment from the stimulation fluid pumping system to one of the plurality of wells, while isolating another of the plurality of wells from the stimulation treatment concurrently with the pumping of the stimulation treatment to prepare the another well for another stimulation treatment. These adjustments to provide the stimulation fluid and isolation of the other well are repeated until each of the plurality of wells have received stimulation treatments. Then, hydrocarbons are produced from the plurality of wells once the stimulation treatments have been performed.

**[0010]** In a second alternative embodiment, a well system is described. In this well system, a plurality of oil field trees is located on a surface pad, wherein each of the plurality of oil field trees is associated with one of a plurality of wells. A pumping system manifold connects a stimulation fluid pumping system to the plurality of oil field trees. The pumping system manifold is configured to provide a flow path from the stimulation fluid pumping system into at least one selected well of the plurality of wells and to isolate at least one non-selected well of the plurality of wells from the stimulation fluid pumping system. Further, the wells, stimulation fluid pumping system, and pumping system manifold may be located on a single surface pad.

**[0011]** In a third alternative embodiment, an apparatus is disclosed. The apparatus includes a main valve associated with a stimulation fluid pumping system, well valves and piping that couples the main valve to the well valves. In this apparatus, each of the well valves is associated with one of the wells and the piping is directly supported by the surface of the Earth. The apparatus may also include a densitometer, a manifold check valve, a pressure gauge, a flow meter, and a ball-seal injector, which are each coupled to the main valve and the well valves.

**[0012]** In a fourth alternative embodiment, a method associated with the production of hydrocarbons is described. The method comprises connecting a first well and a second well to a first stimulation fluid pumping system via a first pumping system manifold; connecting a third well and a fourth well to a second stimulation fluid pumping system via a second pumping manifold; adjusting the first pumping

system manifold to provide a first stimulation treatment to the first well and to isolate the second well for other operations; adjusting the second pumping system manifold to provide a second stimulation treatment to the third well and to isolate the fourth well; and pumping the first stimulation treatment into the first well and the second stimulation treatment into the third well concurrently with the pumping of the first stimulation treatment. Further, the method may also comprise preparing the second well for a third stimulation treatment concurrently with the pumping of the first stimulation treatment; and preparing the fourth well for a fourth stimulation treatment concurrently with the pumping of the second stimulation treatment.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

**[0013]** The foregoing and other advantages of the present technique may become apparent upon reading the following detailed description and upon reference to the drawings in which:

**[0014]** FIG. 1 is an exemplary production system having multiple wells located on a surface pad in accordance with certain aspects of the present techniques;

**[0015]** FIG. 2 is an exemplary surface pad configuration with equipment and wells for use with the production system of FIG. 1 in accordance with certain aspects of the present techniques;

**[0016]** FIG. 3 is an exemplary flow chart of operations performed on the wells located on the surface pad of FIG. 1 in accordance with aspects of the present techniques; and

**[0017]** FIGs. 4-6 are partial views of wells being utilized in concurrent operations associated with stimulation treatments according to the process of FIG. 3 in accordance with certain aspects of the present techniques.

### **DETAILED DESCRIPTION**

**[0018]** In the following detailed description, the specific embodiments of the present invention will be described in connection with its preferred embodiments. However, to the extent that the following description is specific to a particular embodiment or a particular use of the present techniques, this is intended to be

illustrative only and merely provides a concise description of the exemplary embodiments. Accordingly, the invention is not limited to the specific embodiments described below, but rather, the invention includes all alternatives, modifications, and equivalents falling within the true scope of the appended claims.

**[0019]** The present technique is directed to drilling, treating, completing and producing hydrocarbons, such as oil and gas, from subterranean formations in a manner that reduces the overall costs to enable economic hydrocarbon production. In particular, the present techniques describe an apparatus and method for reducing and/or eliminating the non-productive time and resource utilization for drilling, stimulating, and completing multiple wells from a single surface pad or location. That is, the present techniques provide mechanisms to enhance production economics by enabling simultaneous or concurrent operations in the stimulation of multiple wells in a manner that reduces non-productive time for equipment, material, and/or personnel. As such, the present techniques may reduce the cost and time associated with performing operations for stimulation treatments of wells.

**[0020]** Accordingly, the present techniques may be applicable to land-based wells with two or more wells are located on a single surface pad and/or offshore-based wells where two or more wells are located on a single platform location. The present techniques utilize procedures and equipment that allow stimulation treatments to be performed more efficiently. In particular, the present techniques involve connecting two or more wells to a stimulation fluid pumping system via a well coupling system, such as a pumping system manifold. This pumping system manifold contains multiple valves to enable stimulation fluid to be pumped into any selected well, while the other remaining wells are hydraulically isolated from the pressure and energy created by the stimulation fluid pumping system. By isolating the other wells, other operations or activities, such as preparations for the next well to be stimulated or producing hydrocarbons, may be performed on the other wells. As a result, the present techniques enhance the stimulation process for multiple wells located at a single location, such as a surface pad.

**[0021]** Turning now to the drawings, and referring initially to FIG. 1, an exemplary production system **100** having multiple wells located at a single surface pad in accordance with certain aspects of the present techniques is illustrated. In the production system **100**, a surface pad **102** has two or more wells **104a-104n**. Each

of the wells **104a-104n** has an oil field tree **106a-106n** located over the wellbore **108a-108n** and are positioned in a specific configuration. These wellbores **108a-108n** follow specific trajectories that access one or more specific zones or regions **110a-110n** of a subsurface formation **112**. The wellbores **108a-108n** along with any casing or tubing strings utilized may provide flow paths from the respective regions **110a-110n** to one of the trees **106a-106n** for hydrocarbons, such as oil and gas. Within the wellbores **108a-108n**, casing strings or tubing (not shown) may be disposed to support the walls of the wellbore **108a-108n**. It should be understood that "n" may be any number of such units that can be utilized. Further, it should be noted that the production system **100** is illustrated for exemplary purposes and the present techniques may be useful in the production of fluids from any location, which may include offshore or onshore applications and other equipment, as well.

**[0022]** Because the wells **104a-104n** may be drilled in a variety of directions with different trajectories, drilling the wellbores **108a-108n** from a single location may provide access to various lateral and vertical locations, such as the regions **110a-110n** of the subsurface formation **112**. In fact, the wellbores **108a-108n** may penetrate the subsurface formation **112** at specific target locations or regions **110a-110n** that extend substantial lateral distances from the location of the surface pad **102**. The effective drainage area associated with regions **110a-110n** may vary because the resource recovery is influenced by a number of parameters, such as the number of wells drilled, spacing of wells, reservoir properties, and stimulation treatment design and effectiveness. For example, deviated wells may be drilled to depths greater than 20,000 ft with lateral throws greater than 5,000 ft. As such, a single surface pad **102** may include wells **104a-104n** that access and effectively drain hydrocarbon reservoirs, such as subsurface formation **112**, which may be an area greater than approximately 640 acres.

**[0023]** For certain types of subsurface formations **112**, such as low permeability ("tight") gas formations, different stimulation treatments may be utilized to access intervals or zones within the wellbore **108a-108n**. These stimulation techniques or treatments may include hydraulic proppant fracture stimulation and completion technologies to enable commercial development of this type of subsurface formations. For instance, new multi-zone stimulation and completion methods and equipment for the use of these methods are described in U.S. Patent No. 6,394,184,

U.S. Patent No. 6,520,255, U.S. Patent No. 6,543,538, U.S. Patent No. 6,575,247 and U.S. Patent No. 6,672,405, which are incorporated by reference, which describe techniques and tools for stimulating subsurface formations containing multiple hydrocarbon targets at reduced cost compared to conventional single-zone treatment approaches. As disclosed in the patents, the Just-in-Time Perforating ("JITP") and the Annular-Coiled Tubing Fracturing ("ACT-Frac") technologies, methods, and devices provide stimulation treatments to multiple subsurface formations targets within a single wellbore. In particular, the JITP and the ACT-Frac techniques: (1) enable stimulation of multiple target zones or regions via a single deployment of downhole equipment; (2) enable selective placement of each stimulation treatment for each individual zone to enhance well productivity; (3) provide diversion between zones to ensure each zone is treated per design and previously treated zones are not inadvertently damaged; and (4) allow for stimulation treatments to be pumped at high flow rates to facilitate efficient and effective stimulation. As a result, these multi-zone stimulation techniques have been developed to enhance hydrocarbon recovery from subsurface formations that contain multiple stacked subsurface intervals of hydrocarbons within regions of a well.

**[0024]** However, performing these stimulations may include a range of supporting operations that preclude pumping operations in the well at the time of the supporting operation is performed. For instance, non-pumping operations are usually performed when applying these multi-zone stimulation technologies to wells that are stimulated over one or more days. Accordingly, in performing these operations, it may be preferred to set bridge plugs or frac plugs between sets of intervals being treated by the stimulations. Setting these plugs may take substantial time, such as two or more hours depending on the well depth and operating speed of the wireline equipment. During the installation of the plug, it is not possible to perform stimulation treatment pumping operations in the well, which are an expensive portion of the stimulation operation. As a result, for wells containing many zones, the time associated with non-pumping operations may result in substantial incremental costs due to the cost structure associated with time-based equipment and crew fees.

**[0025]** As a specific example, nine wells may be drilled from a single surface location, such as the surface pad **102**, which is six-acre section of land. Each of the nine wells may be drilled with trees positioned in two rows on the surface pad **102**

and separated from each other by approximately fifteen feet. In this manner, the wells may be clustered in a relatively small portion of the surface pad **102** to provide additional space for other equipment that may be used in the stimulation treatments. Eight of the wells may be drilled with s-shape well trajectories, while one of the wells may have a vertical trajectory. Each of these wells may end at a bottomhole location that provides drainage for subsurface formation **112** for about a nominally 20 acre well spacing. Hence, the nine wells may drain about 180 acres from a single six acre surface location.

**[0026]** To enhance the stimulation, completion and production process from these wells on a surface pad, the operations performed on the individual wells may be coordinated and utilize mechanisms to perform these operations in an efficient manner. Accordingly, in FIG. 2, a surface pad configuration is shown with different equipment that may be utilized to perform the stimulation treatments in accordance with the present techniques. An exemplary flow chart is shown in FIG. 3 that describes possible concurrent operations that may be performed to enhance the operation of the wells of FIGs. 1 and 2. FIGs. 4-6 illustrate views of wells with different operations being performed on the wells in accordance with the process of FIG. 3. Accordingly, by utilizing the present techniques, simultaneous or concurrent operations involving stimulation of two or more wells located at a single surface pad may be performed in an efficient manner.

**[0027]** FIG. 2 is an exemplary surface pad configuration with equipment and wells for use with the production system **100** of FIG. 1 in accordance with certain aspects of the present techniques. In FIG. 2, the configuration of surface equipment involved with stimulation treatments by a JITP hydraulic proppant fracture stimulation of three wells **104a-104c** on the surface pad **102** is shown. In particular, to support the JITP hydraulic proppant fracture stimulation operations, the equipment on the surface pad **102** may include a stimulation fluid pumping system **202**, a stimulation storage system **204**, a well coupling system, such as a pumping system manifold **206**, and flowback manifolds **230a-230c**, for example. However, it should be understood that the JITP hydraulic proppant fracture stimulation system is only for exemplary purposes as other types of stimulation systems may also be utilized, including both multiple stage stimulation and single stage stimulation systems.

**[0028]** Generally, the wells **104a-104c** produce hydrocarbons through piping **228a-228c** that is coupled between the respective oil field trees **106a-106c** and the flowback manifolds **230a-230c**. The piping **228a-228c** may include high pressure steel lines utilized in oil field applications. The flowback manifolds **230a-230c** may also be coupled to one or more flowlines **234a-234c**, **236a-236c** and **238a-238c**, respectively. These flowlines **234a-234c**, **236a-236c** and **238a-238c** may be coupled to flowback pits, flow test units, sales lines, tankage, oil/gas/water separating and processing units and/or other similar devices. Thus, the hydrocarbons from the wells **104a-104c** typically flow through the flowback manifolds **230a-230c** for further processing or sales.

**[0029]** To provide a stimulation treatment, the JITP system may include the stimulation fluid pumping system **202** and stimulation fluid storage system **204**. The stimulation fluid pumping system **202** couples to the stimulation fluid storage system **204** via piping **203**, which may be high pressure steel lines or low pressure hoses depending on the specific application. The stimulation fluid storage system **204** is a vessel that holds a sufficient volume of fluid for the planned stimulation treatments. It is noted that the stimulation fluid storage system **204** may include tanks located on the surface pad **102**, a pit dug on the surface pad **102**, and/or a pond, lake, river or water storage facility located in close proximity to the surface pad **102**.

**[0030]** To couple the stimulation fluid pumping system **202** to the trees **106a-106c**, the pumping system manifold **206** is utilized. The pumping system manifold **206** may include various components utilized to manage access to the wells **104a-104c** from the stimulation fluid pumping system **202**. For instance, the pumping system manifold **206** may include a set of pipes **208** to interface each of the trees **106a-106c** with the stimulation fluid pumping system **202**. To manage the flow paths through the pipes **208**, a main manifold valve **210** and a manifold check valve **212** may be located near the stimulation fluid pumping system **202**, while a first manifold well valve **214**, second manifold well valve **216**, and a third manifold well valve **218** may be located near each of the trees **106a-106c**, respectively. Each of the trees **106a-106c** may be connected to the first manifold well valve **214**, second manifold well valve **216**, and a third manifold well valve **218**, respectively, or utilize other devices to couple to the trees **106a-106c**. Valves **210**, **214**, **216** and **218** may be any type of valve, including those routinely used in oil-field applications, such as gate

valves or ball valves, while the manifold check valve **212** may be configured to allow fluid flow from the stimulation fluid pumping system **202**, but to prevent reverse flow of fluids into the stimulation fluid pumping system **202**. These valves **210**, **214**, **216** and **218** may be actuated or positioned to a full-open or full-closed position to provide hydraulic isolation between individual wells **104a-104c** and the stimulation fluid pumping system **202**. While it may be beneficial for the valves **210**, **212**, **214**, **216** and **218** to seal in a "leak-tight" position, in some applications, it may be acceptable to perform operations with leaky hydraulic seals. In addition, the pumping system manifold **206** may include a densitometer **220**, pressure gauge **222**, ball-sealer injector **224** and/or flowmeter **226**, which may be coupled along the piping **208** near the main manifold valve **210**. However, it should be understood that the specific configuration of components described in the pumping system manifold **206** is for exemplary purposes, and other configurations and placement of components may be utilized for additional functionality.

**[0031]** Through the coupling of the valves **210**, **212**, **214**, **216** and **218**, flow paths may be provided through the pumping system manifold **206**. Because the first manifold well valve **214**, second manifold well valve **216**, and a third manifold well valve **218** may be set to an open or closed position, stimulation fluid may be injected into one or more of the wells **104a-104c**, while the other wells **104a-104c** may be isolated by at least one of the valves **214-218** from the stimulation fluid pumping system **202**. To enhance reliability, it may be preferred that two valves, such as a manifold well valve **214-218** and a valve (not shown) on the tree **106a-106c**, are closed during any given isolation from the other wells. Additionally, it may also be preferred that at least one or more valves be installed on trees **106a-106c** and that valves in the open position are marked during the stimulation operations.

**[0032]** Further, other equipment may also be utilized on the surface pad **102**. For instance, a first crane **240** and a second crane **242** may be utilized to suspend stimulation equipment, such as a JITP lubricator system. These cranes **240** and **242** may be located in a fixed position that may access any of the wells **104a-104c** or may be mobile to provide access to any of the wells **104a-104c**. Also, a first wireline unit **244** and a second wireline unit **246** may be used for deploying and activating JITP perforating tools **248**, such as perforating guns, and plug-setting tools **250**, which may include plugs, in the wells **104a-104c**. In addition, a coiled tubing unit

and/or workover rig **252** may be utilized to remove plugs and install production tubing within the wells. The use of the stimulation equipment is further explained below in FIG. 3.

**[0033]** FIG. 3 is an exemplary flow chart of operations that may be performed on the wells **104a-104c** located on the surface pad **102** of FIG. 1 in accordance with aspects of the present techniques. This flow chart, which is referred to by reference numeral **300**, may be best understood by concurrently viewing FIGs. 1 and 2. In this flow chart **300**, various operations may be performed on wells **104a-104n** in a concurrent or substantially simultaneous manner to reduce costs and time associated with stimulating wells. For exemplary purposes, these operations may be specific to JITP hydraulic proppant fracture stimulation operations, which may include the equipment described in FIG. 2. However, it should again be noted that other stimulation techniques or other operations may be performed under the present techniques.

**[0034]** The flow chart begins at block **302**. At block **304**, the wells **104a-104c** are drilled on the surface pad **102**. The drilling operations may include installing the production casing and cementing the production casing into the wellbore **108a-108c**. The drilling operations may also include setting the trees **106a-106c**. Then, the target zones to be stimulated within the completion interval may be identified, as shown by block **306**. The identification of the target zones may be performed by using open-hole and/or cased-hole logs to identify zones that include hydrocarbons.

**[0035]** Once the target zones are identified, the stimulation operations may be performed, as shown in blocks **308-318**. To begin, it should be noted that these stimulation operations may include various activities, such as pumping operations, wireline operations, flowback operations, and other logistical coordination operations. The pumping operations may include high pressure pumping; JITP ball arrival and pressure events; screen-out mitigation and sand flowback; and manipulating pumping manifold valves, wellhead tree valves and/or flowback manifold valves. The wireline operations may include wireless radio and hard wired radios communications; arming perforating guns and plug setting tools; picking-up and laying down perforating guns and plug setting tools; moving wireline in and out of the wellbores; pulling on the wireline to free stuck tools; installing or retrieving perforating guns; and/or raising or lowering man-lifts for personnel access to equipment located

off the surface pad **102**. The flowback operations may include flowing back the well, manipulating choke manifold valves; producing gas to the sales line; and/or venting and flaring gas to the atmosphere. Logistical coordination operations may include water recycling pumping and filtering; proppant delivery; chemical delivery; water hauling; and/or communicating with crews via cellular phones or radios.

**[0036]** In addition, other drilling-related operations, completion-related and production-related operations may be performed on another or a second well. For instance, other operations may include drilling another well; installing tubing into another well; installing a plug within another well; removing debris from another well; removing the plug from another well; installing production tubing in another well; removing production tubing from another well; moving equipment on the surface pad; delivering material on the surface pad; injecting fluid in another well; manipulating valves; performing coiled tubing operations in another well; performing logging operations in another well; producing hydrocarbons from another well; delivering equipment or materials on the surface pad and/or removing equipment or materials from the surface pad.

**[0037]** Accordingly, the surface pad **102** is prepared for the stimulation operations, as shown in block **308**. The preparations may include coupling the piping **228a-228c**, manifold valves **230a-230c** and flowlines **234a-234c**, **236a-236c** and **238a-238c** together and coupling the pumping system manifold **206** to the trees **106a-106c** and the stimulation fluid pumping system **202**. The pumping system manifold **206** may be coupled to any number of wells with the appropriate valves, flow measurements devices, flow control devices. With the equipment in place, the pumping system manifold **206** may be adjusted to prepare a specific well to receive the stimulation treatment, while the other wells are isolated from the stimulation treatment, as shown in block **310**. As an example, for the stimulation treatment to flow into the first well **104a**, the main manifold valve **210** and first manifold well valve **214** may be placed in the open position, while the second manifold well valve **216** and third manifold well valve **218** may be placed in the closed position to isolate the second and third wells **104b** and **104c**.

**[0038]** Once the pumping system manifold **206** is configured, a stimulation treatment may be pumped into the one of the wells, as shown in block **312**. Concurrently, with the stimulation treatment of one of the wells, another well may be

prepared for stimulation treatments, as shown in block **314**, while other operations may be conducted in the remaining wells, as shown in block **316**. The preparations may include using the crane **240** and wireline unit **244** to install and run the JITP perforating tools **248** and plug-setting tools **250** into the another well, performing flow-back operations, performing other wireline operations, injecting fluids or materials, and performing plug removal operations and/or other operations, as discussed further below. By preparing another well concurrently with the stimulation of a first well, the other well may be ready for the stimulation treatment when the stimulation treatment is completed in the first well. In this manner, the execution of simultaneous operations performed on the other wells may reduce "non-pumping" time between the first stimulation treatment of the first well and a second stimulation treatment of another well, and reduce the time and cost of the stimulation operation.

**[0039]** After the first stimulation treatment is completed, a determination is made whether the planned stimulation treatments for the wells are completed, as shown in block **318**. If the planned stimulation treatments for the wells are not complete, then the pumping system manifold **206** may be adjusted to prepare for the next well. That is, the valves in the pumping system manifold **206** are positioned in the appropriate open or closed positions to enable stimulation fluid injection into another of the wells, which is to receive the second stimulation treatment. Again, concurrent or simultaneous operations, such as conveyance of JITP perforating tools **248** and plug-setting tools **250** downhole on wireline and/or flow-back operations may be performed if a third stimulation treatment is to be performed. These simultaneous operations are conducted to prepare other wells for the stimulation treatments with reduced non-pumping time between each of the stimulation treatments. The above process of sequentially manipulating the valves of the pumping system manifold, as shown in block **310**, and pumping stimulation treatments in the wells, while simultaneously performing operations to prepare other wells for further stimulation treatments may be repeated until each of the planned stimulation treatments is completed.

**[0040]** If the planned stimulation treatments for the wells are complete, then the equipment associated with the stimulation treatments may be rigged-down and moved off the surface pad **102**, as shown in block **320**. Then, a workover rig or coiled tubing unit **252** may be located at the surface pad **102** to drill-out the plugs and

run production tubing in each of the wells, as shown in block **322**. With the production tubing installed, the wells may be utilized to produce hydrocarbons, as shown in block **324**. Accordingly, the process ends at block **326**.

**[0041]** Beneficially, the present technique reduces the time associated with stimulating multiple wells on a surface pad by performing concurrent operations on two or more of the wells. Also, by saving time, the present technique reduces the cost of performing stimulations on these wells. Further, the use of the pumping system manifold reduces or eliminates the potential safety hazards and additional time delays associated with rig up and/or rig down of high pressure lines from the stimulation fluid pumping system to the individual wells, which may occur multiple times over the course of many days with the use of conventional methods. A specific example of the present techniques is process below and described in greater detail in FIGs. 4-6.

**[0042]** FIGs. 4-6 are partial views of wells **104a-104c** being utilized to perform concurrent stimulation operations according to the process of FIG. 3 in accordance with certain aspects of the present techniques. The partial views of FIG. 4-6, which are referred to by reference numerals **400**, **500** and **600**, respectively, may be best understood by concurrently viewing FIGs. 1 and 2. In these partial views **400**, **500** and **600**, three wells **104a-104c** from the surface pad **102** are shown with different operations being performed on each of the wells **104a-104c** in a concurrent or substantially simultaneous manner.

**[0043]** For exemplary purposes, the operations performed in FIGs. 4-6 may be specific to a five-stage JITP hydraulic proppant fracture treatment, which may be referred to as a stimulation treatment or JITP fracture treatment. Accordingly, each stage of the JITP fracture treatment includes different sub-stages. These sub-stages are as follows: (a) 5,000 gallons of 2% potassium chloride water solution; (b) 2,000 gallons of guar-based linear gel fracture fluid containing 1 pound-per-gallon of proppant; (c) 3,000 gallons of guar-based linear gel fracture fluid containing 2 pounds-per-gallon of proppant; (d) 10,000 gallons of guar-based linear gel fracture fluid containing 3 pounds-per-gallon of proppant; and (e) 3,000 gallons of guar-based linear gel fracture fluid containing 4 pound-per-gallon of proppant such that 50,000 pounds of proppant and 23,000 gallons (approximately 547 barrels of fluid) of stimulation fluid are used in each stage of the JITP fracture treatment. Then, the

pumping may be performed at an average rate of 20 barrels/minute. As a result, the pumping time for each stage may take approximately 27 minutes. Hence, the pumping time for a JITP fracture treatment may be approximately 2 hours and 15 minutes for each well. The following partial views **400**, **500** and **600** are described in greater detail in each of the FIGs 4-6 below.

**[0044]** To begin, in FIG. 4, the first well **104a** may be stimulated using the JITP fracture treatment. It should be noted that for this stimulation treatment, the main manifold valve **210** and first manifold well valve **214** are in the open position, while the second manifold well valve **216** and third manifold well valve **218** are in the closed position to create a first well flow path. Also, a wireline-deployed JITP perforating gun **402**, which may be one of the JITP perforating tools **248**, is suspended via wireline **403** in the wellbore **108a** using the first crane **240**. This JITP perforating gun **402** is actuated and controlled from the first wireline unit **244**. In the first well **104a**, proppant fracture **404** has been placed into the region **110a** of the subsurface formation **112**. The stimulation fluid is pumped down the wellbore **108a** to create a proppant fracture **406**.

**[0045]** Concurrently, preparation operations may also be performed in the second well **104b**. In the second well **104b**, a wireline-deployed JITP perforating gun **408**, which is another of the JITP perforating tools **248**, and a frac plug setting system **410** having a composite frac plug **409**, which is one of the JITP plug-setting tools **250**, may be deployed via a wireline **411** down the second wellbore **108b** by the second crane **242** and second wireline unit **246**. The second well **104b** may have received a previous stimulation treatment, which has resulted in proppant fractures **412**, **414**, **416**, **418** and **420** in the region **110b** of the subsurface formation **112**. Because these proppant fractures **412**, **414**, **416**, **418** and **420** were previously placed in the subsurface formation **112**, the operations in the second well **104b** may be to place a composite frac plug **409** within the wellbore **108b** above the proppant fractures **412**, **414**, **416**, **418** and **420**.

**[0046]** In addition to the concurrent operations being performed in the second well **104b**, other operations may also be performed in the third well **104c**. For example, in the third well **104c**, proppant fractures **422**, **424**, **426**, **428** and **430** may have been previously formed in the region **110c** of the subsurface formation **112**. Because these proppant fractures **422**, **424**, **426**, **428** and **430** were previously

formed, flowback operations may be performed to force close the proppant fractures **422, 424, 426, 428** and **430** and recover the stimulation fluid used to form the proppant fractures **422, 424, 426, 428** and **430**, and produce hydrocarbons to the sales lines.

**[0047]** Next, FIG. 5 illustrates the wells **104a-104c** after the operations performed in FIG. 4 are completed. As shown in the partial view **500**, the proppant fractures **404, 406, 502, 504** and **506** were created with the pumping of the five-stage JITP treatment in FIG. 4. However, in FIG. 5, the first well **104a** is being flowed back after the placement of proppant fractures **404, 406, 502, 504** and **506** in the region **110a** of the subsurface formation **112** to force close the proppant fractures **404, 406, 502, 504** and **506** and recover the stimulation fluid used to place the proppant fractures **404, 406, 502, 504** and **506**, and produce hydrocarbons to the sales lines.

**[0048]** Concurrently, the second well **104b** may be receiving the five-stage JITP hydraulic proppant fracture treatment. It should be noted that for this stimulation operation, the main manifold valve **210** and second manifold well valve **216** are in the open position, while the first manifold well valve **214** and third manifold well valve **218** are in the closed position to create a second well flow path. Again, as discussed in FIG. 4, the wireline-deployed JITP perforating gun **408** and frac plug setting system **410** are suspended via wireline **411** in the wellbore **108b** using the second crane **242**, which is also actuated and controlled from the second wireline unit **246**. However, in this view, the composite frac plug **409** is set above the proppant fracture **420**. With this composite frac plug **409** installed, the five-stage JITP proppant fracture treatment is underway with the stimulation fluid pumped down the wellbore **108b** to create proppant fracture **510**.

**[0049]** Another concurrent operation is also being performed in the third well **104c**. In this well, the flowback operation has been completed and the well **104c** is now shut-in. Accordingly, to prepare for the next stimulation treatment, a wireline-deployed JITP perforating gun **512**, which is another of the JITP perforating tools **248**, and a frac plug setting system **514** having a composite frac plug **516**, which is one of the JITP plug-setting tools **250**, are deployed down the wellbore **108c**. The JITP perforating gun **512** and a frac plug setting system **514** are suspended via wireline **403** in the wellbore **108c** using the first crane **240**, and are actuated and controlled from the first wireline unit **244**. The JITP perforating gun **512** and frac plug

setting system **514** may then be utilized to JITP stimulate and place additional proppant fractures above the proppant fractures **430**.

**[0050]** Finally, FIG. 6 illustrates the wells **104a-104c** after the operations performed in FIG. 5 are completed. As shown in the partial view **600**, the flowback operation has been completed and the first well **104a** has been shut-in. In this view, the wireline-deployed JITP perforating gun **601**, which is another of the JITP perforating tools **248**, and a frac plug setting system **602** having a composite frac plug **603**, which is one of the JITP plug-setting tools **250**, are deployed down the wellbore **108a**. The JITP perforating gun **601** and frac plug setting system **602** are suspended via wireline **411** in the wellbore **108a** using the second crane **242**, and are actuated and controlled from the second wireline unit **246**. The frac plug setting system **602** may be utilized to set the composite frac plug **603**, while the JITP perforating gun **601** may be utilized in the next five-stage JITP treatment to create proppant fractures above proppant fracture **506** during the next stimulation treatment.

**[0051]** Concurrently, in the second well **104b**, stimulation treatments are completed and the proppant fracture **510**, **604**, **606**, **608** and **610** have been placed into the region **110b** of the subsurface formation **112**. Accordingly, the second well **104b** is flowed back after placement of proppant fractures **510**, **604**, **606**, **608** and **610** to force close the fractures and recover the stimulation fluid used when placing the proppant fractures, and produce hydrocarbons to the sales lines.

**[0052]** Also, in another concurrent operation, the composite frac plug **516** has been set in the third well **104c** and the pumping of a five-stage JITP proppant fracture treatment has created proppant fractures **614** and **616**. It should be noted that for this stimulation treatment, the main manifold valve **210** and third manifold well valve **218** are in the open position, while the first manifold well valve **214** and second manifold well valve **216** are in the closed position to create a third well fluid flow path. Again, as discussed in FIG. 5, the wireline-deployed JITP perforating gun **512** and frac plug setting system **514** are suspended via wireline **403** in the wellbore **108c** using the first crane **240** and is actuated and controlled from the first wireline unit **244**. In this view, a composite frac plug **516** is set above the proppant fracture **430**. With this composite frac plug **516** installed, the JITP proppant fracture treatment is performed to form the proppant fractures **614** and **616** by having the stimulation fluid pumped down the wellbore **108c**.

**[0053]** Beneficially, in this example, the concurrent operations enhance the stimulation treatment process. For instance, if the wireline running speeds is approximately 150 ft/min (feet/minute) to 300 ft/min for the assumed approximate 12,000 ft well depth, then, the time to pump a total of fifteen proppant fracture treatments is approximately ten hours. Accordingly, each well receiving the stimulation treatment may be flowed back overnight for several hours of stimulation fluid recovery and for oil and gas sales. In this manner, the stimulation treatments for multiple wells may be performed in an efficient manner that reduces time and cost.

**[0054]** To further explain the benefits of the present techniques, another example is described. In this example, nine wells may be drilled on a single surface pad of approximately six acres. These wells may target gas-productive reservoir targets, such as sand bodies, within a subsurface formation, and are configured to drain an area of approximately 20 acres. For these wells, the well depths may range between approximately 12,000 ft to 15,000 ft with lateral throws of approximately 1,400 ft to 2,000 ft relative to the surface pad. The size and location of the surface pad may be determined by the geological and reservoir characteristics, governmental regulations, surface topography and terrain, and consideration of environmental or regulatory requirements that are identified during the pad selection/location process. The characteristic features of the subsurface formation may be gas resources contained in multiple (e.g., 20+ to 40+) low permeability ("tight") gas sands of limited areal extent distributed over a large vertical section of approximately 4,000 ft to 6,000 ft thick interval. Accordingly, each well includes up to forty or more reservoir targets or zones.

**[0055]** To access these target zones, the wells are stimulated with the JITP stimulation techniques with each five stage JITP fracture treatment separated by a plug. The wireline plug-setting operation, which may be approximately two to four hours depending on well depth, running speed, and rig-up/rig-down time, may be completed while the stimulation treatment pumping operations are performed on another well. The stimulation treatment pumping operations for the five zones may be completed in approximately 3 hours. Accordingly, fifteen to twenty zones may be pumped each work day, which results in approximately two or three work days to complete a forty zone stimulation operation. Thus, by performing the stimulation operations in a concurrent manner, a total of approximately one or two work days

associated with "non-pumping time" may be saved on each well during the stimulation treatments.

**[0056]** In addition, it should be noted that these stimulation operations may include various activities. For instance, as noted above, the stimulation operations may include pumping operations, wireline operations, flowback operations, and logistical coordination operations. Because these stimulation operations may be performed concurrently or simultaneously on different wells on a single surface pad, several risks associated with the different operations may be present. Accordingly, certain stimulation operations may be performed concurrently to reduce the risks and maintain the operational integrity of the simultaneous operations.

**[0057]** To begin, in performing the concurrent stimulation operations, different combinations of pumping operations, wireline operations, flowback operations, and logistical coordination operations may be performed on the different wells with certain monitoring procedures. The monitoring procedures may include using a spotter for certain operations, a light or audible warning, obtaining supervisor approval for certain operations, communicating between personnel, flagging or labeling valve positions, following lock-out tag-out procedures, and other similar processes. For instance, when the stimulation operations are being performed on the first well, operations, such as proppant delivery, chemical delivery, and/or water hauling, on the second well may be performed within designated areas and using a spotter, which is discussed below. As another example, supervisor approval may be obtained before venting gas when the operations on the other well involve high pressure pumping, manipulating pumping manifold/frac valves and gas to sales line operations. Further, when the operations on the first well involve high pressure pumping, operations on the second well, such as arming the perforating gun or setting tool and picking-up or laying down the perforating gun or setting tool, may utilize lights and audible notifications. Finally, it may be preferred to not perform certain operations concurrently. For instance, if the operations on the first well involve high pressure pumping or JITP ball sealing pressure events, the manipulating the manifold well valves and wellhead tree valves should not be concurrently performed. Also, if operations on the first well include wireless radio and cell phone communications, then the operations should not be performed concurrently with arming perforating guns and setting tools.

**[0058]** Another method of reducing risk may include assigning personnel to manage the operations. For instance, if a crane, such as cranes **240** and **242** of FIG. 2, are used as part of the stimulation operations, it may be preferred that the personnel operating the crane include a designated spotter to assist with crane operations. Further, the crane may be positioned to reduce potential collisions with other equipment on the surface pad. Also, based on the potential for hydraulically-energized lines associated with injection and flowback from the wells, it may be preferred that one of the personnel associated with the stimulation system manage the stimulation pumping valve positions and the flowback valve positions, while concurrent operations are being performed.

**[0059]** In another embodiment, it may be preferred to include monitoring equipment at the surface pad **102** of FIG. 2, which may detect gases, such as hydrocarbon gases. For example, the surface pad **102** and/or personnel may be equipped with portable Lower-Explosive Limit ("LEL") detectors. Accordingly, during flowback operations, the LEL detectors may continuously monitor the surface pad **102** for the presence of hazardous gas levels. If hazardous gas levels are detected, the flowback operations may be suspended and appropriate activities may be performed to solve any problems with equipment. Also, it may be preferred that windscreens are installed at various points and heights on the surface pad **102** to aid in determining wind direction, as well.

**[0060]** Further, in another alternative embodiment, it may be beneficial to have automated devices, such as processor based devices, which are utilized for the stimulation operations. For instance, the stimulation fluid pumping system **202** may be automated and controlled by a processor based device, such as a computer system. With the computer system, the stimulation treatment schedules for each individual stimulation treatment may be pre-programmed into the computer system. Also, the pumping system manifold **206** may include a processor based device, such as a computer system, as well. The computer system for the pumping system manifold **206** may include mechanisms to adjust the valves **210**, **214**, **216** and **218** between the open and closed positions, and communicate with the various gauges **220**, **222** and **226** and ball-sealer injector **224**. In fact, the computer systems of the stimulation fluid pumping system **202** and the pumping system manifold **206** may be

configured to interact with each other to manage the pumping stimulation treatment process for the plurality of wells **104a-104c**.

**[0061]** In a third alternative embodiment, the designation of specific work areas for certain operations for handling associated tools and equipment may be performed between blocks **306** and **318** of FIG. 3. That is, the process may include designating different areas, such as high-pressure pumping area, wireline/crane areas, and flowback areas, on the surface pad **102** of FIG. 2 to prevent unauthorized personnel from entering restricted areas. The designation of work areas may include providing detailed drawings of piping, valves, and flow control/measurement devices for the operations for each of the work areas and wells. For instance, if cranes **240** and **242** and wireline units **244** and **246** of FIG. 2 are used, it may be preferred that a designated wireline/crane area be located surrounding and adjacent to each of the cranes **240** and **242**. Also, it may be preferred that stimulation equipment, such as the stimulation fluid pumping system **202**, stimulation fluid storage system **204** and pumping system manifold **206** of FIG. 2, are arranged on the surface pad **102** with pathways or routes around the outer perimeter of the high-pressure pumping area to provide access for reloading of stimulation materials and supplies. Further, it may be preferred that piping and valves be identified using different unique colored markings or other labels for each of the different wells to assist in visual observations and understanding of the flow paths and equipment tie-in points.

**[0062]** Also, in a fourth alternative embodiment, it may be preferable for a communication protocol to be established between blocks **306** and **318** of FIG. 3. For example, when executing simultaneous wireline operations, if select-fire perforating guns are used, it may be preferred that wireless communication devices, such as radios and other cellular devices, are turned off and/or stored in a central location when a gun is armed and placed in the wellbore or removed from the wellbore. Alternatively, it may be preferred that "hard-wired" radios and communication devices are used as the primary communication devices with wireless communication devices only utilized as back-up equipment. Further, strobe-warning lights and/or a loudspeaker system may be used to provide an indication of the status of the gun arming sequence and depth of gun during the operations.

**[0063]** It should be noted that the pumping system manifold **206** of FIG. 2 may not include each of the components described above. Indeed, in alternative

embodiments, additional measurement devices, flow control devices, fluid injection or withdrawal ports, and/or material injection or withdrawal ports may be included in the pumping system manifold **206** and/or upstream or downstream of the pumping system manifold **206**.

**[0064]** Furthermore, it should also be noted that the number of wells and geometry of the surface location may be influenced by a number of factors to conform to appropriate regulatory requirements and other factors. Accordingly, wells may possess vertical, deviated, S-shaped, and/or horizontal trajectories. For example, these trajectories may target multiple hydrocarbon bearing targets being drilled, stimulated, and completed on approximately 5/8 acre spacing in low-permeability oil fields; on approximately 10 to 40 acre well spacing in tight gas fields; and on approximately 40 acre, 80 acre and/or 160 acre spacing associated with in-fill drilling processes. Also, wells may be completed as cased-hole completions or open-hole completions. In addition, the present techniques may include a single unique surface area (i.e. pad) or two or more surface pads in sufficiently close proximity for performing the drilling, stimulation, completion, and production operations objectives. The possible use of wells from two or more surface pads may be determined based on local geographic conditions, material supply routes, and/or overall field infrastructure, specific operational requirements, and/or economic considerations.

**[0065]** As noted above, the present techniques may also be used for stimulation treatments involving hydraulic fracturing or acid stimulation in production or injection wells. Hydraulic fracturing may include injecting fluids into a formation at high pressures and rates that the reservoir rock fails and granular proppant material, such as sand, ceramic beads, or other materials, is injected to hold the fracture(s) open. Increased reservoir production capacity or injection capacity results from the flow path left between the grains of the proppant material within the fracture(s). In chemical stimulation treatments, such as matrix acidizing treatments or acid fracturing treatments, flow capacity is improved by dissolving materials in the formation or otherwise changing formation properties.

**[0066]** Moreover, the present techniques may be used for stimulation treatments involving multiple stage treatments or single-stage treatments. Multiple stage stimulation treatments may include the JITP or ACT-Frac treatment methods, which

are discussed above. In addition, the multiple stage stimulation treatments may include other multiple stage treatments, such as stimulation treatments disclosed in U.S. Patent 5,890,536 and U.S. Patent No. 6,186,230, which are herein incorporated by reference. Also, other methods utilized in oil and gas operations, such as "limited-entry" diverted multi-stage treatments, annular coiled-tubing, coiled-tubing, ball-sealer multi-stage treatments, modified limited entry multi-stage treatments, induced stress diverted treatments, or multiple single-stage treatments separated by plugs, or any combination of treatments, may also be utilized with the present techniques.

**[0067]** In addition, it should be appreciated that the surface pad, such as surface pad 102, may include two or more stimulation fluid pumping systems. For instance, a surface pad may include two stimulation fluid pumping system, which are stimulation fluid pumping system **202** of FIG. 2. This configuration for the surface pad may also include two stimulation storage systems **204**, two pumping system manifolds **206**, and other associated piping. Each of the stimulation storage systems, pumping system manifolds, and other associated piping may each be associated with two different groups or sets of wells. In this manner, two wells may be stimulated concurrently or simultaneously. That is, one well associated with each of the stimulation fluid pumping systems may receive stimulation treatments, while other wells from the well groups may be prepared for stimulation treatments.

**[0068]** While the present techniques of the invention may be susceptible to various modifications and alternative forms, the exemplary embodiments discussed above have been shown by way of example. However, it should again be understood that the invention is not intended to be limited to the particular embodiments disclosed herein. Indeed, the present techniques of the invention are to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the following appended claims.

**CLAIMS**

What is claimed is:

1. A method associated with the production of hydrocarbons comprising:  
connecting a plurality of wells to a stimulation fluid pumping system via a pumping system manifold;  
adjusting the pumping system manifold to provide a first well flow path from the stimulation fluid pumping system to a first well of the plurality of wells;  
pumping a first stimulation treatment into the first well; and  
preparing a second well of the plurality of wells for a second stimulation treatment concurrently with the pumping of the first stimulation treatment.
2. The method of claim 1 wherein adjusting the pumping system manifold comprises configuring at least one of a plurality of valves to provide the first well flow path and configuring at least one of the plurality of valves to isolate the first stimulation treatment from entering the second well.
3. The method of claim 1 further comprising adjusting the pumping system manifold to provide a second well flow path from the stimulation fluid pumping system to the second well.
4. The method of claim 3 further comprising pumping the second stimulation treatment in the second well.
5. The method of claim 1 wherein the first stimulation treatment comprises one of hydraulic proppant fracture treatment, acid fracture treatment, matrix acid treatment and any combination thereof.
6. The method of claim 1 wherein the first stimulation treatment comprises one of just-in-time perforating, annular coiled-tubing, coiled-tubing, limited-entry, ball-sealer, modified limited entry, induced stress diverted, or one or more single-stage stimulation treatments separated by plugs and any combination thereof.

7. The method of claim 1 wherein the first stimulation treatment comprises a multi-zone just-in-time perforating hydraulic proppant fracture stimulation treatment.
8. The method of claim 1 wherein preparing the second well comprises one of drilling the second well, installing tubing into the second well, installing a plug within the second well, flowing back the second well, removing debris from the second well, removing the plug from the second well, removing tubing from the second well, moving equipment on a surface pad, delivering material on the surface pad, communicating by radio or cellular phone on the surface pad, injecting fluid in the second well, manipulating valves, performing wireline operations in the second well, performing coiled tubing operations in the second well, installing or retrieving perforating guns in the second well, performing logging operations in the second well, producing hydrocarbons from the second well, venting gas on the surface pad, flaring gas on the surface pad, delivering equipment or materials on the surface pad, removing equipment or materials from the surface pad and performing logging operations.
9. The method of claim 1 further comprising producing hydrocarbons from the plurality of wells.
10. The method of claim 1 further comprising drilling the plurality of wells from a single surface pad.
11. The method of claim 1 wherein the plurality of wells are located on a single surface pad.
12. The method of claim 1 wherein the plurality of wells are in close proximity to each other on one or more surface pads or platforms.
13. The method of claim 1 further comprising installing production tubing into each of the plurality of wells.
14. A method associated with the production of hydrocarbons comprising the steps of:
  - a) connecting a plurality of wells to a stimulation fluid pumping system via a pumping system manifold;

b) adjusting the pumping system manifold to provide a stimulation treatment from the stimulation fluid pumping system to one of the plurality of wells;

c) isolating another of the plurality of wells from the stimulation treatment concurrently with the pumping of the stimulation treatment to prepare the another well for another stimulation treatment;

d) repeating steps b and c until each of the plurality of wells have received stimulation treatments; and

e) producing hydrocarbons from the plurality of wells once the stimulation treatments have been performed.

15. The method of claim 14 wherein the plurality of wells are located on a single surface pad.

16. A well system comprising:

a plurality of oil field trees located on a surface pad, wherein each of the plurality of oil field trees is associated with one of a plurality of wells;

a stimulation fluid pumping system; and

a pumping system manifold connecting the stimulation fluid pumping system to the plurality of oil field trees.

17. The well system of claim 16 wherein the pumping system manifold is configured to:

provide a flow path from the stimulation fluid pumping system into at least one selected well of the plurality of wells; and

isolate at least one non-selected well of the plurality of wells from the stimulation fluid pumping system.

18. The well system of claim 16 wherein the pumping system manifold comprises a plurality of valves.

19. The well system of claim 18 wherein the plurality of valves comprises at least one of a ball valve, gate valve and any combination thereof.

20. The well system of claim 16 wherein the plurality of wells are associated with a single surface pad.

21. The well system of claim 16 wherein the plurality of wells are in close proximity to each other on one or more surface pads.
22. The well system of claim 16 further comprising a stimulation fluid storage system coupled to the stimulation fluid pumping system.
23. The well system of claim 16 wherein at least two of the plurality of wells penetrate multiple hydrocarbon-bearing reservoirs.
24. The well system of claim 16 wherein the stimulation fluid pumping system and the pumping system manifold provide multi-zone stimulation treatments to the multiple hydrocarbon-bearing reservoirs penetrated by the at least two of the plurality of wells.
25. The well system of claim 16 wherein the stimulation fluid pumping system is a hydraulic proppant fracture stimulation system.
26. The well system of claim 16, wherein the stimulation fluid pumping system is one of a Just-in-Time Perforating system and a Annular-Coiled Tubing Fracturing system.
27. The well system of claim 16 further comprising:
  - a plurality of additional oil field trees located on the surface pad, wherein each of the plurality of additional oil field trees are associated with one of a plurality of additional wells;
  - an additional stimulation fluid pumping system; and
  - an additional pumping system manifold connecting the additional stimulation fluid pumping system to the plurality of additional oil field trees.
28. An apparatus for stimulating surface wells comprising:
  - a main valve associated with a stimulation fluid pumping system;
  - a plurality of well valves, wherein each of the plurality of well valves is associated with one of a plurality of wells; and

piping coupling the main valve to the plurality of well valves, wherein the piping is directly supported by the surface of the Earth.

29. The apparatus of claim 28 further comprising a densitometer coupled to the main valve and the plurality of well valves.

30. The apparatus of claim 28 wherein the plurality of well valves comprises at least one of a ball valve, gate valve and any combination thereof.

31. The apparatus of claim 28 further comprising at least one manifold check valve coupled to the main valve and the plurality of well valves.

32. The apparatus of claim 28 further comprising at least one pressure gauge coupled to the main valve and the plurality of well valves.

33. The apparatus of claim 28 further comprising at least one flow meter coupled to the main valve and the plurality of well valves.

34. The apparatus of claim 28 further comprising at least one ball-seal injector coupled to the main valve and the plurality of well valves.

35. A method associated with the production of hydrocarbons comprising:  
    connecting a first well and a second well to a first stimulation fluid pumping system via a first pumping system manifold;  
    connecting a third well and a fourth well to a second stimulation fluid pumping system via a second pumping manifold;  
    adjusting the first pumping system manifold to provide a first stimulation treatment to the first well and to isolate the second well for other operations;  
    adjusting the second pumping system manifold to provide a second stimulation treatment to the third well and to isolate the fourth well; and  
    pumping the first stimulation treatment into the first well and the second stimulation treatment into the third well concurrently with the pumping of the first stimulation treatment.

36. The method of claim 35 further comprising:  
preparing the second well for a third stimulation treatment concurrently with the pumping of the first stimulation treatment; and  
preparing the fourth well for a fourth stimulation treatment concurrently with the pumping of the second stimulation treatment.

37. The method of claim 36 wherein the preparing the second well for a third stimulation treatment comprises disposing a JITP perforating tool into the second well.

38. The method of claim 36 wherein the first stimulation treatment comprises one of hydraulic proppant fracture treatment, acid fracture treatment, matrix acid treatment and any combination thereof.

39. The method of claim 35 wherein the first stimulation treatment and the second stimulation treatment comprise one of just-in-time perforating, annular coiled-tubing, coiled-tubing, limited-entry, ball-sealer, modified limited entry, induced stress diverted, or one or more single-stage stimulation treatments separated by plugs and any combination thereof.

40. The method of claim 35 wherein the first stimulation treatment comprises a multi-zone just-in-time perforating hydraulic proppant fracture stimulation treatment.

41. The method of claim 36 wherein preparing the second well comprises one of drilling the second well, installing tubing into the second well, installing a plug within the second well, flowing back the second well, removing debris from the second well, removing the plug from the second well, removing tubing from the second well, moving equipment on a surface pad, delivering material on the surface pad, communicating by radio or cellular phone on the surface pad, injecting fluid in the second well, manipulating valves, performing wireline operations in the second well, performing coiled tubing operations in the second well, installing or retrieving perforating guns in the second well, performing logging operations in the second well, producing hydrocarbons from the second well, venting gas on the surface pad, flaring gas on the surface pad, delivering equipment or materials on the surface pad,

removing equipment or materials from the surface pad and performing logging operations.

42. The method of claim 35 comprising producing hydrocarbons from the first well once the stimulation treatment is completed.

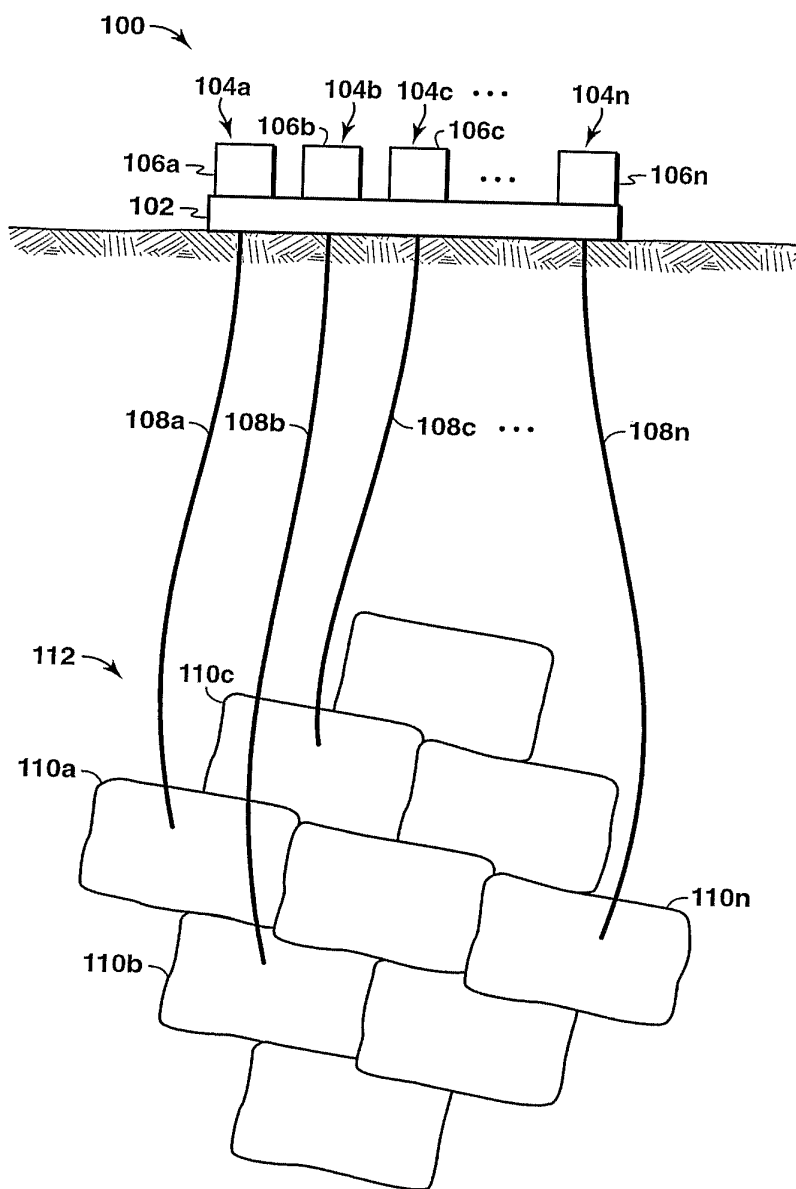
43. The method of claim 35 further comprising drilling the first well, second well, third well and fourth well from a single surface pad.

44. The method of claim 35 wherein the first well, second well, third well and fourth well are located on a single surface pad.

45. The method of claim 35 wherein the first well, second well, third well and fourth well are in close proximity to each other on one or more surface pads or platforms.

46. The method of claim 35 comprising installing production tubing into each of the first well, second well, third well and fourth well.

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**FIG. 1**

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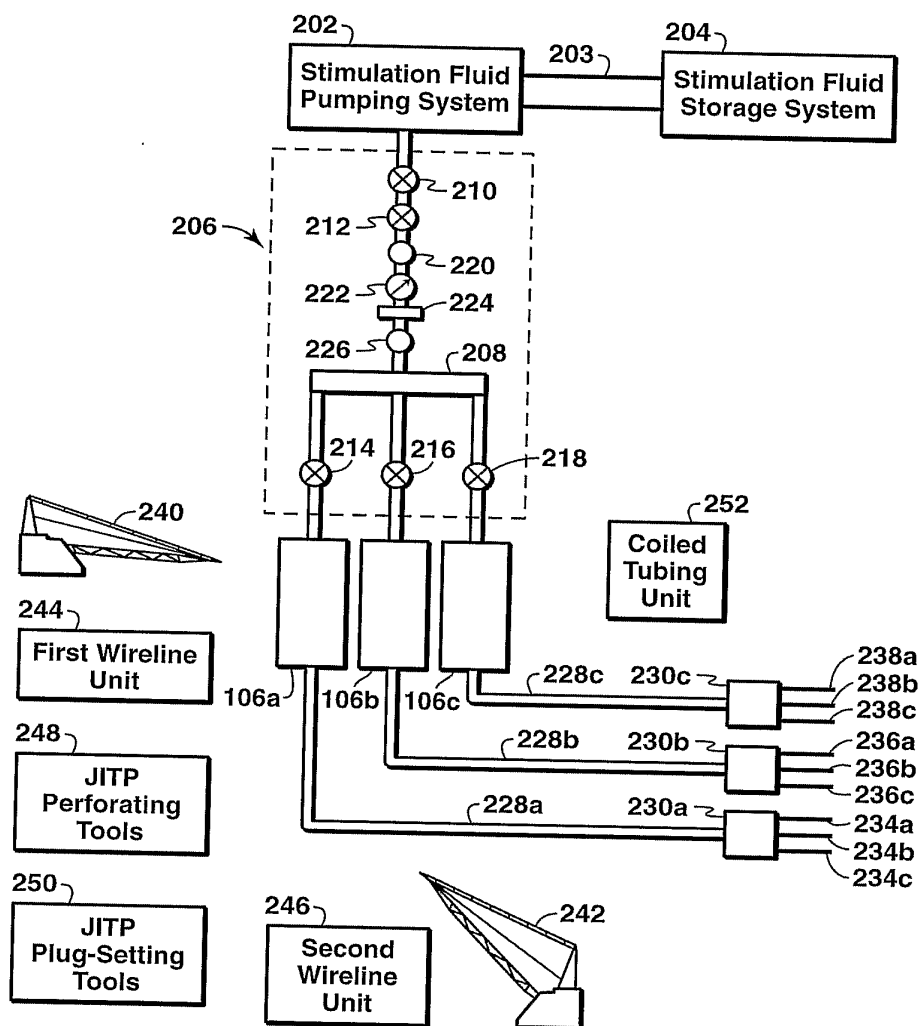


FIG. 2

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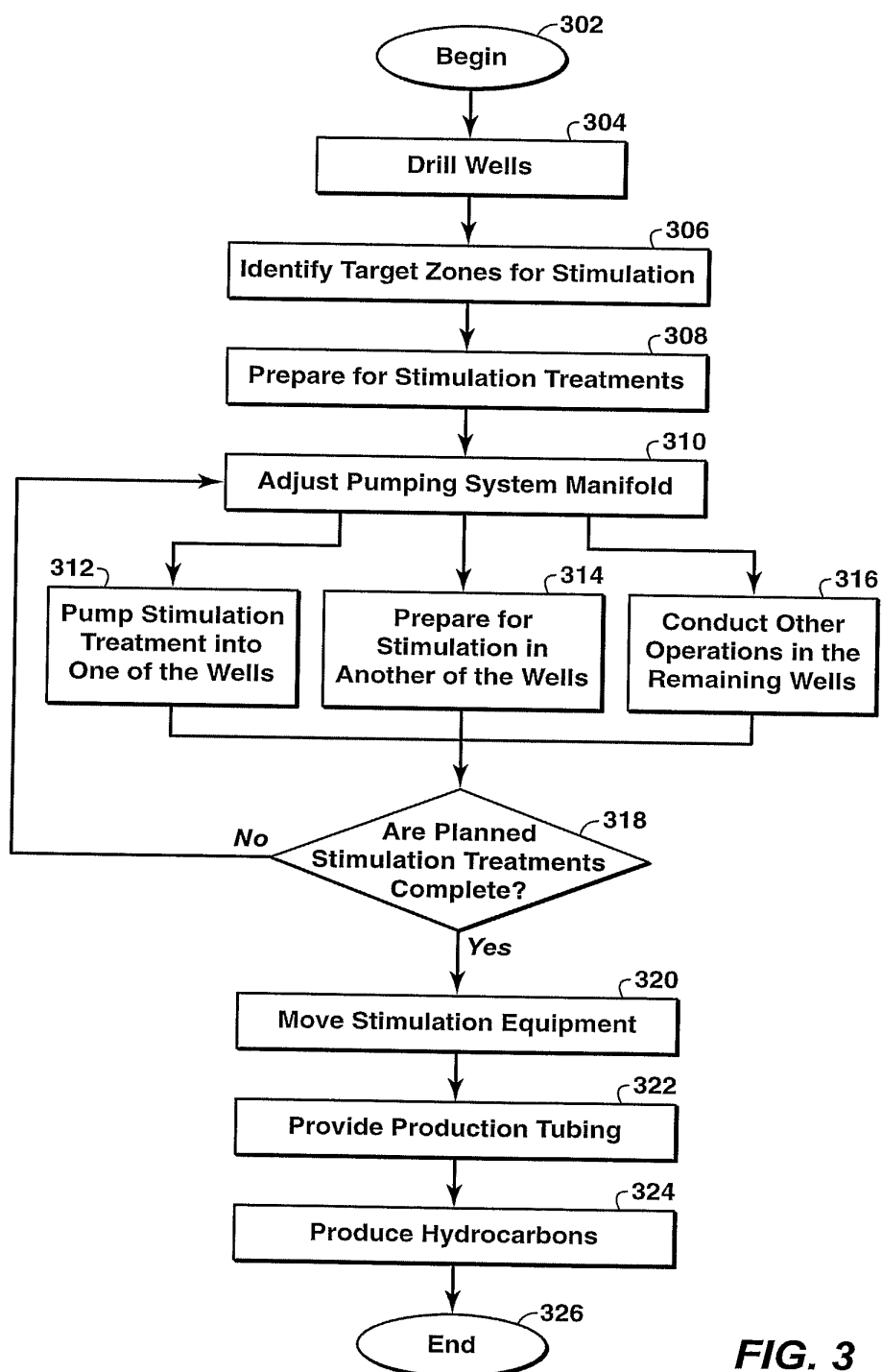


FIG. 3

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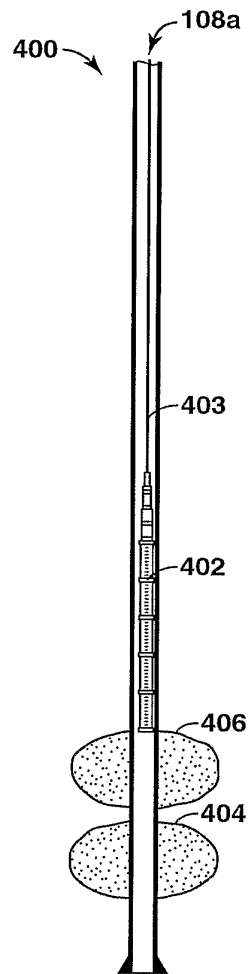


**FIG. 4A**

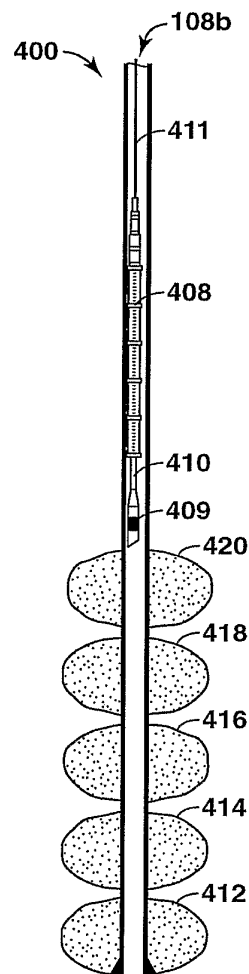


**FIG. 4B**

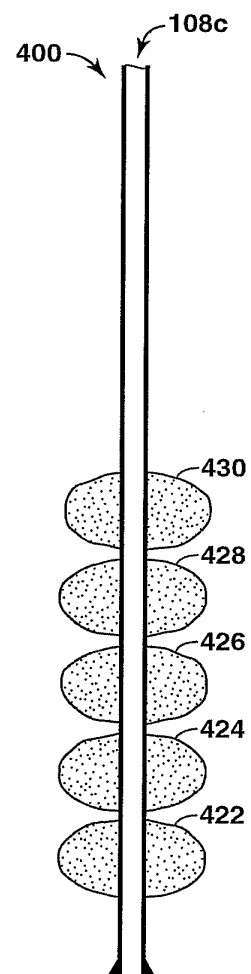


**FIG. 4C**

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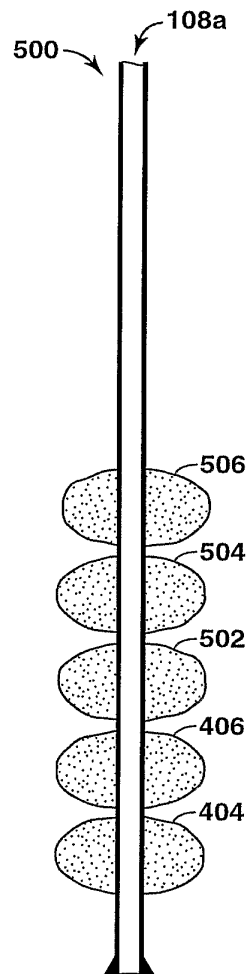


**FIG. 5A**

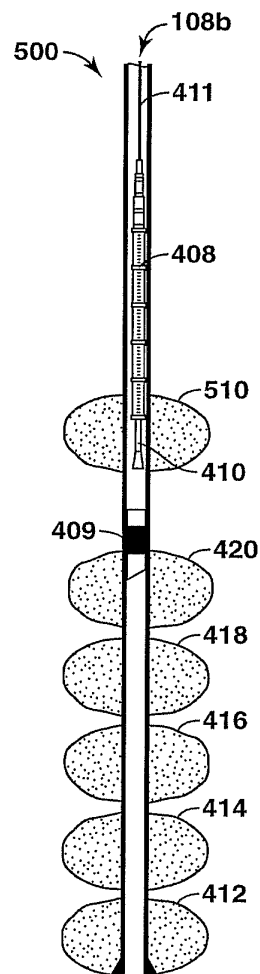


**FIG. 5B**

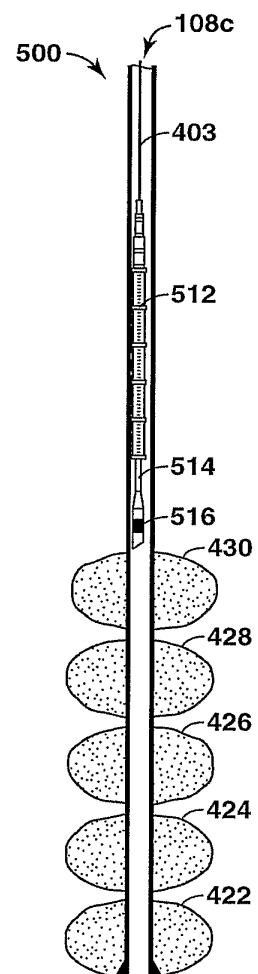
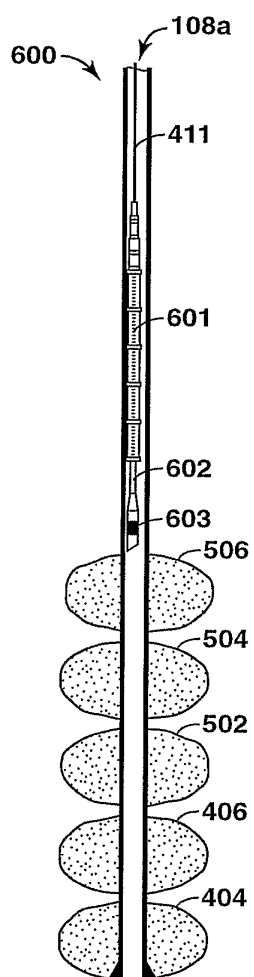
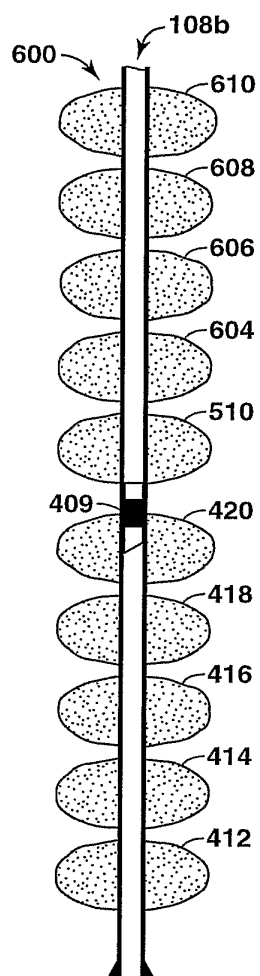
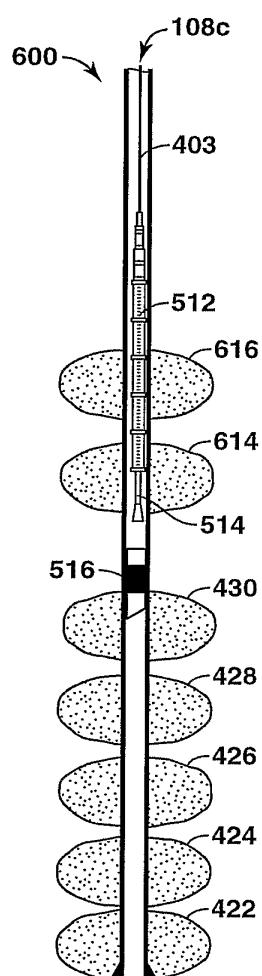


**FIG. 5C**

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**FIG. 6A****FIG. 6B****FIG. 6C**



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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------|------------------------------------|
| <b>SERIAL NUMBER</b><br>11/873,186                                                                                                                                                                                                                                              | <b>FILING or 371(c)<br/>DATE</b><br>10/16/2007<br><b>RULE</b>                                                     | <b>CLASS</b><br>166                                      | <b>GROUP ART UNIT</b><br>3676                                                                                                                                                                                                                                             | <b>ATTORNEY DOCKET<br/>NO.</b><br>2006-IP-021186U1 |                               |                                    |
| <b>APPLICANTS</b><br>Jim B. Surjaatmadja, Duncan, OK;<br><b>** CONTINUING DATA *****</b><br><b>** FOREIGN APPLICATIONS *****</b><br><b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b><br>11/02/2007                                                                      |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                    |                               |                                    |
| Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Verified and Acknowledged <u>/ZAKIYA W BATES/</u><br>Examiner's Signature |                                                                                                                   | <input type="checkbox"/> Met after Allowance<br>Initials | <b>STATE OR<br/>COUNTRY</b><br>OK                                                                                                                                                                                                                                         | <b>SHEETS<br/>DRAWINGS</b><br>7                    | <b>TOTAL<br/>CLAIMS</b><br>31 | <b>INDEPENDENT<br/>CLAIMS</b><br>2 |
| <b>ADDRESS</b><br>JOHN W. WUSTENBERG<br>P.O. BOX 1431<br>DUNCAN, OK 73536<br>UNITED STATES                                                                                                                                                                                      |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                    |                               |                                    |
| <b>TITLE</b><br>Method and System for Centralized Well Treatment                                                                                                                                                                                                                |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                    |                               |                                    |
| <b>FILING FEE<br/>RECEIVED</b><br>1710                                                                                                                                                                                                                                          | FEES: Authority has been given in Paper<br>No. _____ to charge/credit DEPOSIT ACCOUNT<br>No. _____ for following: |                                                          | <input type="checkbox"/> All Fees<br><input type="checkbox"/> 1.16 Fees (Filing)<br><input type="checkbox"/> 1.17 Fees (Processing Ext. of time)<br><input type="checkbox"/> 1.18 Fees (Issue)<br><input type="checkbox"/> Other _____<br><input type="checkbox"/> Credit |                                                    |                               |                                    |

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| L2    | 5    | "2007024383"                                                                                                                                             | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2009/03/16<br>21:27 |

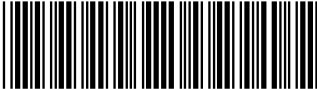
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| L4    | 84   | ("2953460"  <br>"2980291"  <br>"20040020662"  <br>"20060161358"  <br>"20070153622"  <br>"20070153623"  <br>"20070153624"  <br>"20070201305"  <br>"20080083532"  <br>"3556218"  <br>"3578080"  <br>"4137970"  <br>"4209278"  <br>"4265266"  <br>"4305463"  <br>"4353482"  <br>"4409927"  <br>"4410106"  <br>"4427133"  <br>"4635723"  <br>"4701095"  <br>"4724905"  <br>"4830106"  <br>"4850750"  <br>"5014218"  <br>"5245548"  <br>"5281023"  <br>"5365435"  <br>"5515920"  <br>"5574218"  <br>"5659480"  <br>"6120175"  <br>"6193402"  <br>"6575247"  <br>"7036587"  <br>"7143842").PN. | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2009/03/16<br>21:43 |

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|                                                                                                     | Filing Date            |                      | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |
|                                                                                                     | Art Unit               | 3676                 |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

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|                   | 8       | 6120175       |                        | 2000-09-19 | Tewell                                          |                                                                          |

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| Art Unit               | 3676                 |
| Examiner Name          | Bates, Zakiya W.     |
| Attorney Docket Number | HES 2006-IP-021186U1 |

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     | 11873186             |
|                                                                                                     | Filing Date            | 2007-10-16           |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |
|                                                                                                     | Art Unit               | 3676                 |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |

**U.S.PATENTS**

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

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| Application Number     | 11873186             |
| Filing Date            | 2007-10-16           |
| First Named Inventor   | Surjaatmadja         |
| Art Unit               | 3676                 |
| Examiner Name          | Bates, Zakiya W.     |
| Attorney Docket Number | HES 2006-IP-021186U1 |

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| 1 | Office Action for U.S. Serial No. 11/545,749, mailed February 10, 2009 | <input type="checkbox"/> |
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|                                                                                                     | Filing Date            |                      | 2007-10-16 |  |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |  |
|                                                                                                     | Art Unit               |                      |            |  |
|                                                                                                     | Examiner Name          |                      |            |  |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |  |

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|-------------------|---------|--------------------|------------------------|------------------|-------------------------------------------------|--------------------------------------------------------------------------|
|                   | 1       | 20080236818        | A1                     | 2008-10-02       | Dykstra                                         |                                                                          |

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|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |
|                                                                                                     | Art Unit               |                      |            |
|                                                                                                     | Examiner Name          |                      |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

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<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|---------------------------------------------------------------------------------|------------------------|---------------------------------------------|-------------------------|----------|-----------------------|
| PTO-1449                                                                                                                                                                                                                                      |    | Application No.<br><b>11/873,186</b>                                            |                        | Applicant(s):<br><b>SURJAATMADJA ET AL.</b> |                         |          |                       |
| Information Disclosure Citation<br>in an Application                                                                                                                                                                                          |    | Docket Number                                                                   |                        | Group Art Unit                              | Filing Date             |          |                       |
|                                                                                                                                                                                                                                               |    | <b>HES 2006-IP-021186U1</b>                                                     |                        | <b>3676</b>                                 | <b>October 16, 2007</b> |          |                       |
| U.S. PATENT DOCUMENTS                                                                                                                                                                                                                         |    |                                                                                 |                        |                                             |                         |          |                       |
|                                                                                                                                                                                                                                               |    | DOCUMENT NO.                                                                    | ISSUE/<br>PUB.<br>DATE | NAME                                        | CLASS                   | SUBCLASS | FILING DATE           |
|                                                                                                                                                                                                                                               | 1  | US 5,281,023                                                                    | 01-25-94               | CEDILLO ET AL.                              | 366                     | 17       | 08-02-89              |
|                                                                                                                                                                                                                                               | 2  | US 5,365,435                                                                    | 11-15-94               | STEPHENSON                                  | 700                     | 265      | 02-19-93              |
|                                                                                                                                                                                                                                               | 3  | 2004/0020662                                                                    | 02-05-04               | FREYER                                      | 166                     | 387      | 06-29-01              |
|                                                                                                                                                                                                                                               | 4  | 2008/0083532                                                                    | 04-10-08               | SURJAATMADJA                                | 166                     | 250.1    | 05-24-07              |
| FOREIGN PATENT DOCUMENTS                                                                                                                                                                                                                      |    |                                                                                 |                        |                                             |                         |          |                       |
|                                                                                                                                                                                                                                               |    | DOCUMENT NO.                                                                    | DATE                   | COUNTRY                                     | CLASS                   | SUBCLASS | TRANSLATION<br>YES NO |
|                                                                                                                                                                                                                                               | 1  | WO 2006/109035 A                                                                | 10-19-06               |                                             | G05D                    | 11/13    |                       |
| NON-PATENT DOCUMENTS                                                                                                                                                                                                                          |    |                                                                                 |                        |                                             |                         |          |                       |
|                                                                                                                                                                                                                                               |    | DOCUMENT (Including Author, Title, Source, and Pertinent Pages)                 |                        |                                             |                         |          | DATE                  |
|                                                                                                                                                                                                                                               | 1  | Information Disclosure Statement for Application Serial No. 11/291,496          |                        |                                             |                         |          | 11-21-06              |
|                                                                                                                                                                                                                                               | 2  | International Search Report for International Application No. PCT/GB2007/000677 |                        |                                             |                         |          | 06-11-07              |
|                                                                                                                                                                                                                                               | 3  | International Search Report for International Application No. PCT/GB2007/001189 |                        |                                             |                         |          | 09-05-07              |
|                                                                                                                                                                                                                                               | 4  | Information Disclosure Statement for Application Serial No. 11/396,918          |                        |                                             |                         |          | 10-15-07              |
|                                                                                                                                                                                                                                               | 5  | Information Disclosure Statement for Application Serial No. 11/873,160          |                        |                                             |                         |          | 10-16-07              |
|                                                                                                                                                                                                                                               | 6  | <del>Office Action for Application Serial No. 11,296,918</del>                  |                        |                                             |                         |          | <del>01-25-08</del>   |
|                                                                                                                                                                                                                                               | 7  | <del>Office Action for Application Serial No. 11,753,314</del>                  |                        |                                             |                         |          | <del>06-12-08</del>   |
|                                                                                                                                                                                                                                               | 8  | International Search Report for International Application No. PCT/GB2008/001044 |                        |                                             |                         |          | 08-13-08              |
|                                                                                                                                                                                                                                               | 9  | <del>Office Action for Application Serial No. 11,291,496</del>                  |                        |                                             |                         |          | <del>08-21-08</del>   |
|                                                                                                                                                                                                                                               | 10 | Notice of Publication for Application Serial No. 11/691,623                     |                        |                                             |                         |          | 10-02-08              |
| EXAMINER                                                                                                                                                                                                                                      |    |                                                                                 |                        |                                             | DATE CONSIDERED         |          |                       |
| /Zakiya Bates/ (03/16/2009)                                                                                                                                                                                                                   |    |                                                                                 |                        |                                             |                         |          |                       |
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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                      | 11873186   |
|                                                                                                     | Filing Date            |                      | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |
|                                                                                                     | Art Unit               | 3676                 |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

| U.S.PATENTS                                                                                                |         |                    |                        |                  |                                                 |                                                                        |
|------------------------------------------------------------------------------------------------------------|---------|--------------------|------------------------|------------------|-------------------------------------------------|------------------------------------------------------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number      | Kind Code <sup>1</sup> | Issue Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|                                                                                                            | 1       | 5574218            |                        | 1996-11-12       | Withers                                         |                                                                        |
|                                                                                                            | 2       | 6575247            |                        | 2003-06-10       | Tolman, et al.                                  |                                                                        |
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| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                    |                        |                  |                                                 |                                                                        |
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|                                                                                                            | 1       | 20030050758        | A1                     | 2003-03-13       | Soliman, Mohamed Y., et al.                     |                                                                        |
|                                                                                                            | 2       | 20060289167        | A1                     | 2006-12-28       | Surjaatmadja, Jim B., et al.                    |                                                                        |
|                                                                                                            | 3       | 20080083538        | A1                     | 2008-04-10       | Soliman, Mohamed Y.                             |                                                                        |
|                                                                                                            | 4       | 20030141064        | A1                     | 2003-07-31       | Roberson, James David, Jr.                      |                                                                        |
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|                    | 1       | <del>Office Action for U.S. Serial No. 11/753,314 dated November 10, 2008</del>                                                                                                                                                                                 | <input type="checkbox"/> |
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|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |  |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |  |

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|                   | 1       | 4715721       |                        | 1987-12-29 | Walker, et al.                                  |                                                                          |

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|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

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( Not for submission under 37 CFR 1.99)

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| Art Unit               | 3676                 |
| Examiner Name          | Bates, Zakiya W.     |
| Attorney Docket Number | HES 2006-IP-021186U1 |

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

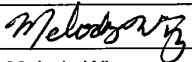
**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-03-23 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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| <b>EFS ID:</b>                              | 5012512                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Elizabeth L. Durham/Debbie Allen                 |
| <b>Filer Authorized By:</b>                 | Elizabeth L. Durham                              |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 23-MAR-2009                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 12:26:23                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

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### File Listing:

| Document Number | Document Description | File Name         | File Size(Bytes)/ Message Digest         | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------|------------------------------------------|------------------|------------------|
| 1               |                      | 0637181162IDS.PDF | 708598                                   | yes              | 17               |
|                 |                      |                   | 7489624977ca17ceab0a5733ee20ecb18a64ba0d |                  |                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Multipart Description/PDF files in .zip description  |        |     |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Information Disclosure Statement (IDS) Filed (SB/08) | 1      | 3   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | NPL Documents                                        | 4      | 17  |
| Warnings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      |        |     |
| Information:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |        |     |
| Total Files Size (in bytes):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      | 708598 |     |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                      |        |     |



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| APPLICATION NUMBER | FILING OR 371(C) DATE | FIRST NAMED APPLICANT | ATTY. DOCKET NO./TITLE |
|--------------------|-----------------------|-----------------------|------------------------|
| 11/873,186         | 10/16/2007            | Jim B. Surjaatmadja   | 2006-IP-021186U1       |

**CONFIRMATION NO. 1172**

29920  
JOHN W. WUSTENBERG  
P.O. BOX 1431  
DUNCAN, OK 73536

## PUBLICATION NOTICE



\*OC000000035512407\*

**Title:**Method and System for Centralized Well Treatment

**Publication No.**US-2009-0095482-A1

**Publication Date:**04/16/2009

## NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at [www.uspto.gov](http://www.uspto.gov). The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

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Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 07/31/2008. OMB 0651-0031

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|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

| U.S.PATENTS       |         |               |                        |            |                                                 |                                                                        |
|-------------------|---------|---------------|------------------------|------------|-------------------------------------------------|------------------------------------------------------------------------|
| Examiner Initial* | Cite No | Patent Number | Kind Code <sup>1</sup> | Issue Date | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|                   | 1       | 2758653       |                        | 1956-08-14 | Desbrow                                         |                                                                        |
|                   | 2       | 3062286       |                        | 1962-11-06 | Wyllie                                          |                                                                        |
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EFS Web 2.1.3

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|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|------------|
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|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

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|--|----|---------|--|------------|----------------------|--|
|  | 9  | 5494103 |  | 1996-02-27 | Surjaatmadja, et al. |  |
|  | 10 | 5499678 |  | 1996-03-19 | Surjaatmadja, et al. |  |
|  | 11 | 6729394 |  | 2004-05-04 | Hassan, et al.       |  |
|  | 12 | 7225869 |  | 2007-06-05 | Willet, et al.       |  |
|  | 13 | 7431090 |  | 2008-10-07 | Surjaatmadja, et al. |  |
|  | 14 | 7445045 |  | 2008-11-04 | East, Jr., et al.    |  |

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#### U.S.PATENT APPLICATION PUBLICATIONS

| Examiner Initial* | Cite No | Publication Number | Kind Code <sup>1</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
|-------------------|---------|--------------------|------------------------|------------------|-------------------------------------------------|--------------------------------------------------------------------------|
|                   | 1       | 20050121196        | A1                     | 2005-06-09       | East, Loyd E. Jr., et al.                       |                                                                          |
|                   | 2       | 20050211439        | A1                     | 2005-09-29       | Willet, Ronald M., et al.                       |                                                                          |
|                   | 3       | 20060185848        | A1                     | 2006-08-24       | Surjaatmadja, Jim B., et al.                    |                                                                          |

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|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|------------|--|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |  |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |  |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |  |
|                                                                                                     | Art Unit               | 3676                |            |  |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |  |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |  |

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|  | 4 | 20070116546 | A1 | 2007-05-24 | Dearing, Mike      |  |
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#### FOREIGN PATENT DOCUMENTS

| Examiner Initial* | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|-------------------|---------|--------------------------------------|---------------------------|------------------------|------------------|-------------------------------------------------|--------------------------------------------------------------------------|--------------------------|
|                   | 1       |                                      |                           |                        |                  |                                                 |                                                                          | <input type="checkbox"/> |

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| Examiner Initials* | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>5</sup>           |
|--------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|                    | 1       | Office Action for U.S. Serial No. 11/396,918, dated April 29, 2009                                                                                                                                                                                              | <input type="checkbox"/> |
|                    | 2       | Office Action for U.S. Serial No. 11/545,749, dated May 1, 2009                                                                                                                                                                                                 | <input type="checkbox"/> |

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|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     | 11873186            |
|                                                                                                     | Filing Date            | 2007-10-16          |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |
|                                                                                                     | Art Unit               | 3676                |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |

<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

|                                                                                                     |                        |                     |            |
|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

### CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

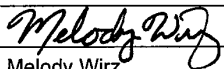
☐ See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

### SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-05-05 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Patent Application Fee Transmittal |          |                                                  |        |                      |
|-----------------------------------------------|----------|--------------------------------------------------|--------|----------------------|
| Application Number:                           |          | 11873186                                         |        |                      |
| Filing Date:                                  |          | 16-Oct-2007                                      |        |                      |
| Title of Invention:                           |          | Method and System for Centralized Well Treatment |        |                      |
| First Named Inventor/Applicant Name:          |          | Jim B. Surjaatmadja                              |        |                      |
| Filer:                                        |          | Elizabeth L. Durham/Debbie Allen                 |        |                      |
| Attorney Docket Number:                       |          | 2006-IP-021186U1                                 |        |                      |
| Filed as Large Entity                         |          |                                                  |        |                      |
| Utility under 35 USC 111(a) Filing Fees       |          |                                                  |        |                      |
| Description                                   | Fee Code | Quantity                                         | Amount | Sub-Total in USD(\$) |
| Basic Filing:                                 |          |                                                  |        |                      |
| Pages:                                        |          |                                                  |        |                      |
| Claims:                                       |          |                                                  |        |                      |
| Miscellaneous-Filing:                         |          |                                                  |        |                      |
| Petition:                                     |          |                                                  |        |                      |
| Patent-Appeals-and-Interference:              |          |                                                  |        |                      |
| Post-Allowance-and-Post-Issuance:             |          |                                                  |        |                      |
| Extension-of-Time:                            |          |                                                  |        |                      |

| Description                             | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|-----------------------------------------|----------|----------|--------|----------------------|
| <b>Miscellaneous:</b>                   |          |          |        |                      |
| Submission- Information Disclosure Stmt | 1806     | 1        | 180    | 180                  |
| <b>Total in USD (\$)</b>                |          |          |        | <b>180</b>           |

| <b>Electronic Acknowledgement Receipt</b>   |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <b>EFS ID:</b>                              | 5275568                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Elizabeth L. Durham/Debbie Allen                 |
| <b>Filer Authorized By:</b>                 | Elizabeth L. Durham                              |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 05-MAY-2009                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 10:13:52                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

### **Payment information:**

|                                                                                                                                                                                                                                                                                                    |                 |
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| Submitted with Payment                                                                                                                                                                                                                                                                             | yes             |
| Payment Type                                                                                                                                                                                                                                                                                       | Deposit Account |
| Payment was successfully received in RAM                                                                                                                                                                                                                                                           | \$180           |
| RAM confirmation Number                                                                                                                                                                                                                                                                            | 7035            |
| Deposit Account                                                                                                                                                                                                                                                                                    | 020383          |
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**File Listing:**

| Document Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Document Description                                 | File Name         | File Size(Bytes)/<br>Message Digest                 | Multi Part /.zip | Pages (if appl.) |
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| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                      | 0637181162IDS.PDF | 1213147<br>aebe27718a61f6984d1f8d15a1fc83646de0d0fe | yes              | 32               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Multipart Description/PDF files in .zip description  |                   |                                                     |                  |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Document Description                                 |                   | Start                                               | End              |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Information Disclosure Statement (IDS) Filed (SB/08) |                   | 1                                                   | 5                |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | NPL Documents                                        |                   | 6                                                   | 19               |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | NPL Documents                                        |                   | 20                                                  | 32               |                  |
| Warnings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      |                   |                                                     |                  |                  |
| Information:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |                   |                                                     |                  |                  |
| 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Fee Worksheet (PTO-875)                              | fee-info.pdf      | 30110<br>b4ecf50f117ec8b8aa2ed87310d8b1c4ecba9afe   | no               | 2                |
| Warnings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      |                   |                                                     |                  |                  |
| Information:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |                   |                                                     |                  |                  |
| Total Files Size (in bytes):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |                   | 1243257                                             |                  |                  |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                      |                   |                                                     |                  |                  |

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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|-----------------------------------------------------------------------------------------------------|------------------------|------------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     | 11873186         |
|                                                                                                     | Filing Date            | 2007-10-16       |
|                                                                                                     | First Named Inventor   | Jim Surjaatmadja |
|                                                                                                     | Art Unit               | 3676             |
|                                                                                                     | Examiner Name          | Bates, Zakiya W. |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |

| U.S.PATENTS                                                                                                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
|------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|-------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number                                                                                                                                                                                                                                                   | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |                                                                          |                          |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
| If you wish to add additional U.S. Patent citation information please click the Add button.                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |                                                                          |                          |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
| If you wish to add additional U.S. Published Application citation information please click the Add button. |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
| FOREIGN PATENT DOCUMENTS                                                                                   |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup>                                                                                                                                                                                                                            | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                          | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          | <input type="checkbox"/> |
| If you wish to add additional Foreign Patent Document citation information please click the Add button     |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
| NON-PATENT LITERATURE DOCUMENTS                                                                            |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                          |                                                                          |                          |
| Examiner Initials*                                                                                         | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |                           |                        |                                                 |                                                                          |                                                                          | T <sup>5</sup>           |

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|-----------------------------------------------------------------------------------------------------|------------------------|------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676             |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W. |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                 |                          |
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| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Office Action for U.S. Serial No. 11/753,314, dated May 5, 2009 | <input type="checkbox"/> |
| If you wish to add additional non-patent literature document citation information please click the Add button                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                 |                          |
| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                 |                          |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                 | Date Considered          |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                 |                          |
| <small> <sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.         </small> |                                                                 |                          |

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|-----------------------------------------------------------------------------------------------------|------------------------|------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676             |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W. |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |

### CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

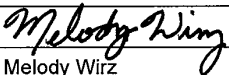
☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

### SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-05-19 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Acknowledgement Receipt   |                                                  |
|--------------------------------------|--------------------------------------------------|
| EFS ID:                              | 5357451                                          |
| Application Number:                  | 11873186                                         |
| International Application Number:    |                                                  |
| Confirmation Number:                 | 1172                                             |
| Title of Invention:                  | Method and System for Centralized Well Treatment |
| First Named Inventor/Applicant Name: | Jim B. Surjaatmadja                              |
| Customer Number:                     | 29920                                            |
| Filer:                               | Elizabeth L. Durham/Debbie Allen                 |
| Filer Authorized By:                 | Elizabeth L. Durham                              |
| Attorney Docket Number:              | 2006-IP-021186U1                                 |
| Receipt Date:                        | 19-MAY-2009                                      |
| Filing Date:                         | 16-OCT-2007                                      |
| Time Stamp:                          | 10:14:58                                         |
| Application Type:                    | Utility under 35 USC 111(a)                      |

### Payment information:

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

### File Listing:

| Document Number | Document Description | File Name         | File Size(Bytes)/ Message Digest         | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------|------------------------------------------|------------------|------------------|
| 1               |                      | 0637181162IDS.pdf | 297170                                   | yes              | 9                |
|                 |                      |                   | e3e72bc12b4912c311d4f21da4b08962a976841e |                  |                  |

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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Document Description</b>                                | <b>Start</b> | <b>End</b> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Information Disclosure Statement (IDS) Filed (SB/08)       | 1            | 3          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | NPL Documents                                              | 4            | 9          |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                            |              |            |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                            |              |            |
| <b>Total Files Size (in bytes):</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                            |              | 297170     |
| <p><b>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</b></p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                            |              |            |

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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|-----------------------------------------------------------------------------------------------------|------------------------|------------------|------------|--|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |  |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |  |
|                                                                                                     | First Named Inventor   | Surjaatmadja     |            |  |
|                                                                                                     | Art Unit               | 3676             |            |  |
|                                                                                                     | Examiner Name          | Zakiya W. Bates  |            |  |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |  |

| U.S.PATENTS                                                                                                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
|------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number                                                                                                                                                                                                                                                   | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       | 6644844                                                                                                                                                                                                                                                         |                           | 2003-11-11             | Neal, et al.                                    |                                                                        |                                                                        |                          |
| If you wish to add additional U.S. Patent citation information please click the Add button.                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| If you wish to add additional U.S. Published Application citation information please click the Add button. |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| FOREIGN PATENT DOCUMENTS                                                                                   |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup>                                                                                                                                                                                                                            | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        | <input type="checkbox"/> |
| If you wish to add additional Foreign Patent Document citation information please click the Add button     |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| NON-PATENT LITERATURE DOCUMENTS                                                                            |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initials*                                                                                         | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |                           |                        |                                                 |                                                                        |                                                                        | T <sup>5</sup>           |

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja     |            |
|                                                                                                     | Art Unit               | 3676             |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates  |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------|--------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1 | Office Action for U.S. Serial No. 11/291,496, dated May 19, 2009 | <input type="checkbox"/> |
| If you wish to add additional non-patent literature document citation information please click the Add button                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |                                                                  |                          |
| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                                                                  |                          |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   | Date Considered                                                  |                          |
| <p>*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>                                                                                                                                                                                                                                                                                                                                                                         |   |                                                                  |                          |
| <p><sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.</p> |   |                                                                  |                          |

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|-----------------------------------------------------------------------------------------------------|------------------------|------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja     |            |
|                                                                                                     | Art Unit               | 3676             |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates  |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |

### CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

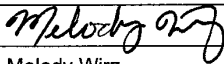
☐ See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

### SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-05-26 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Acknowledgement Receipt          |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <b>EFS ID:</b>                              | 5392102                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Elizabeth L. Durham/Debbie Allen                 |
| <b>Filer Authorized By:</b>                 | Elizabeth L. Durham                              |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 26-MAY-2009                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 12:49:05                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

**Payment information:**

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|------------------------|----|
| Submitted with Payment | no |
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**File Listing:**

| Document Number | Document Description | File Name         | File Size(Bytes)/<br>Message Digest      | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------|------------------------------------------|------------------|------------------|
| 1               |                      | 0637181162IDS.PDF | 437198                                   | yes              | 11               |
|                 |                      |                   | 11f7da2a67911784276cb9742155dbb60500ab07 |                  |                  |

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| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                      |        |     |



## **REMARKS / ARGUMENTS**

### **I. General Remarks.**

Applicants respectfully request reconsideration of the application in view of the remarks contained herein.

### **II. Disposition of the Claims.**

At the time of the Office Action, claims 1-31 were pending. Claims 1-31 stand rejected. The Applicants respectfully traverse the Examiner's rejections.

### **III. Remarks Regarding the Prior Art Reference.**

The Examiner rejected claims 1-31 as being anticipated by Tolman et al. (WO2007/024383) (or US equivalent 2006028608). Office Action, at 2. However, the Applicants were unable to locate the US equivalent of Tolman as U.S. Published Application No. 2006028608 is an application entitled "System and Method of Perception-Based Image Generation and Encoding" issued to Jenkins. Therefore, the Applicants respectfully request a clarification on the identification of the US equivalent of Tolman.

### **IV. Remarks Regarding Rejections under 35 U.S.C. § 102.**

Claims 1-31 are rejected under 35 U.S.C. § 102(e) as being anticipated by Tolman et al. (WO 2007/024383) (hereinafter "Tolman"). With respect to this rejection the Examiner states:

With respect to system claims 17-31, the reference discloses a system for centralized well operations comprising: a well treatment operations factory which manufactures and pumps a well stimulation fluid; a first connection between a first well location and the well operations factory; a second connection between a second well location and the well operations factory; and means for simultaneously flowing: a first stimulation fluid to the first well location and not to the second well location; and a second stimulation fluid to the second well location and not to the first well location (see esp. [0012]; [0018]-[0041]; [0067]). . . With reference to claims 1-16, the reference teaches the associated methods.

Office Action, at 3-4.

In order to form a basis for an anticipation rejection under 35 U.S.C. § 102(e), a prior art reference must disclose each and every element as set forth in the claim. MANUAL OF PATENT EXAMINING PROCEDURE § 2131 (2005). The Applicants respectfully traverse the Examiner's rejections because Tolman fails to disclose all limitations of independent claims 1 and 17 of the present application. Specifically, Tolman fails to disclose a centralized well treatment fluid center as recited in independent claims 1 and 17.

The present disclosure recites an embodiment where a centralized well treatment fluid center is located about the oil field. Specification, paragraph [0018]. The centralized well treatment fluid center may be coupled to centralized service factories by distribution lines adapted to flow well development task fluids from the centralized well treatment fluid center to the centralized service factories and return lines adapted to flow recovered well treatment fluids or production fluids from centralized service factories to the centralized well treatment fluid center. Specification, paragraph [0019]. The centralized service factories are distributed about the oil field in locations that provide efficient treatment to a plurality of wells. Specification, paragraph [0019].

Accordingly, independent claim 1 recites "flowing from a centralized well treatment fluid center to one or more centralized service factories one or more well development task fluids", "preparing, at the one or more centralized service factories, one or more well treatment fluids from the one or more well development task fluids", "flowing from the one or more centralized service factories to at least one of the plurality of wells the one or more well treatment fluids", "recovering from the at least one of the plurality of wells the one or more well treatment fluids at the one or more centralized service factories", and "flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more recovered well treatment fluids." Similarly, independent claim 17 recites "a centralized well treatment fluid center", "one or more centralized service factories" and a plurality of distribution lines and return lines between the centralized well treatment fluid center and the one or more centralized service factories.

The Examiner has not identified a centralized well treatment fluid center in Tolman. Figure 1 of Tolman is a production system having multiple wells located on a surface pad and Figure 2 is a surface pad configuration with equipment and wells for use with the

production system. Tolman, paragraphs [0014]-[0015]. The portions of Tolman recited by the Examiner merely discuss connecting two or more wells to a stimulation fluid pumping system via a well coupling system, such as a pumping system manifold. Tolman, paragraph [0020]. Assuming, *arguendo*, that the stimulation fluid pumping system and/or the well coupling system of Tolman are analogous to the centralized service factories recited in independent claims 1 and 17, Tolman nevertheless fails to disclose a centralized well treatment fluid center coupled to one or more centralized service factories which can provide well development task fluids to the one or more centralized service factories through distribution lines and receive production fluids or recovered well treatment fluids from the one or more centralized service factories through return lines. Similarly, the remaining portions of Tolman fail to disclose a centralized well treatment fluid center which is coupled to one or more service factories with distribution lines and return lines, as recited in independent claims 1 and 17.

Therefore, Tolman fails to disclose all limitations of independent claims 1 and 17. Claims 2-16 and 18-31 depend from independent claims 1 and 17 and are therefore allowable over Tolman for at least the same reasons. Accordingly, the Applicants respectfully request a withdrawal of these rejections.

**V. No Waiver.**

All of Applicant's arguments are without prejudice or disclaimer. Additionally, Applicant has merely discussed example distinctions from the cited references. Other distinctions may exist, and Applicant reserves the right to discuss these additional distinctions in a later Response or on Appeal, if appropriate. By not responding to additional statements made by the Examiner, Applicant does not acquiesce to Examiner's additional statements, such as, for example, any statements relating to what would be obvious to a person of ordinary skill in the art. The example distinctions discussed by Applicant are sufficient to overcome the anticipation rejections.

**SUMMARY**

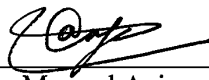
In light of the above remarks, Applicants respectfully request reconsideration and withdrawal of the outstanding rejections. Applicant further submits that the application is now in condition for allowance, and earnestly solicits timely notice of the same. Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of this

application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

Applicants believe that no fees are due in association with the filing of this Response. Should the Commissioner deem that any fees are due, including any fees for extensions of time, the Commissioner is authorized to debit Baker Botts L.L.P. Deposit Account No. 02-0383, Order Number 063718.1162, for any underpayment of fees that may be due in association with this filing.

Respectfully submitted,

Date: June 12, 2009

By:   
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ATTORNEY FOR APPLICANT

| Electronic Acknowledgement Receipt   |                                                  |
|--------------------------------------|--------------------------------------------------|
| EFS ID:                              | 5509468                                          |
| Application Number:                  | 11873186                                         |
| International Application Number:    |                                                  |
| Confirmation Number:                 | 1172                                             |
| Title of Invention:                  | Method and System for Centralized Well Treatment |
| First Named Inventor/Applicant Name: | Jim B. Surjaatmadja                              |
| Customer Number:                     | 29920                                            |
| Filer:                               | Elizabeth L. Durham/Debbie Allen                 |
| Filer Authorized By:                 | Elizabeth L. Durham                              |
| Attorney Docket Number:              | 2006-IP-021186U1                                 |
| Receipt Date:                        | 12-JUN-2009                                      |
| Filing Date:                         | 16-OCT-2007                                      |
| Time Stamp:                          | 17:00:34                                         |
| Application Type:                    | Utility under 35 USC 111(a)                      |

### Payment information:

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| Document Number | Document Description | File Name         | File Size(Bytes)/<br>Message Digest                | Multi Part /.zip | Pages (if appl.) |
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| 1               |                      | 0637181162ROA.PDF | 258949<br>b18835f8f9035a535dc58a7d56ee71dba0b02851 | yes              | 7                |

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| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                       |        |     |

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| In re Application of:                | § |                                           |
| <b>SURJAATMADJA</b>                  | § | Group Art Unit: <b>3676</b>               |
|                                      | § |                                           |
| Serial No.: <b>11/873,186</b>        | § | Confirmation No.: <b>1172</b>             |
|                                      | § |                                           |
| Filed: <b>OCTOBER 16, 2007</b>       | § | Examiner: <b>BATES, ZAKIYA W.</b>         |
|                                      | § |                                           |
| Title: <b>“METHOD AND SYSTEM FOR</b> | § |                                           |
| <b>CENTRALIZED WELL TREATMENT”</b>   | § | Atty. Docket No:                          |
|                                      | § | <b>HES 2006-IP-021186U1 (063718.1162)</b> |

Respectfully submitted,

Date: June 12, 2009

By: \_\_\_\_\_



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ATTORNEY FOR APPLICANT

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |  |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |  |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |  |
|                                                                                                     | Art Unit               | 3676                |            |  |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |  |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |  |

| U.S.PATENTS                                                                                                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
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| Examiner Initial*                                                                                          | Cite No | Patent Number                                                                                                                                                                                                                                                   | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
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| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
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| FOREIGN PATENT DOCUMENTS                                                                                   |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup>                                                                                                                                                                                                                            | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
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| If you wish to add additional Foreign Patent Document citation information please click the Add button     |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| NON-PATENT LITERATURE DOCUMENTS                                                                            |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initials*                                                                                         | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |                           |                        |                                                 |                                                                        |                                                                        | T <sup>5</sup>           |

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

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| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Office Action for U.S. Patent Application No. 11/691,623, dated July 9, 2009 | <input type="checkbox"/> |
| If you wish to add additional non-patent literature document citation information please click the Add button                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                              |                          |
| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                              |                          |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                              | Date Considered          |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                              |                          |
| <small> <sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.         </small> |                                                                              |                          |

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

### CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

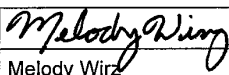
☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

### SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-07-16 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Acknowledgement Receipt   |                                                  |
|--------------------------------------|--------------------------------------------------|
| EFS ID:                              | 5714660                                          |
| Application Number:                  | 11873186                                         |
| International Application Number:    |                                                  |
| Confirmation Number:                 | 1172                                             |
| Title of Invention:                  | Method and System for Centralized Well Treatment |
| First Named Inventor/Applicant Name: | Jim B. Surjaatmadja                              |
| Customer Number:                     | 29920                                            |
| Filer:                               | Elizabeth L. Durham/Debbie Allen                 |
| Filer Authorized By:                 | Elizabeth L. Durham                              |
| Attorney Docket Number:              | 2006-IP-021186U1                                 |
| Receipt Date:                        | 16-JUL-2009                                      |
| Filing Date:                         | 16-OCT-2007                                      |
| Time Stamp:                          | 14:10:08                                         |
| Application Type:                    | Utility under 35 USC 111(a)                      |

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| Document Number | Document Description | File Name         | File Size(Bytes)/<br>Message Digest      | Multi Part /.zip | Pages (if appl.) |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | NPL Documents                                        | 4      | 8   |
| Warnings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      |        |     |
| Information:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      |        |     |
| Total Files Size (in bytes):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                      | 282704 |     |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/>If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/>If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/>If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                      |        |     |

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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|                                                                                                     |                        |                     |            |
|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

| U.S.PATENTS                                                                                                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
|------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number                                                                                                                                                                                                                                                   | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| If you wish to add additional U.S. Patent citation information please click the Add button.                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       | 20090194273                                                                                                                                                                                                                                                     | A1                        | 2009-08-06             | Surjaatmadja                                    |                                                                        |                                                                        |                          |
| If you wish to add additional U.S. Published Application citation information please click the Add button. |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| FOREIGN PATENT DOCUMENTS                                                                                   |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup>                                                                                                                                                                                                                            | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        | <input type="checkbox"/> |
| If you wish to add additional Foreign Patent Document citation information please click the Add button     |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| NON-PATENT LITERATURE DOCUMENTS                                                                            |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initials*                                                                                         | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |                           |                        |                                                 |                                                                        |                                                                        | T <sup>5</sup>           |

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |
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|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |                 |                          |
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| If you wish to add additional non-patent literature document citation information please click the Add button                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |                 |                          |
| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |                 |                          |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   | Date Considered |                          |
| <p>*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.</p>                                                                                                                                                                                                                                                                                                                                                                         |   |                 |                          |
| <p><sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.</p> |   |                 |                          |

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

|                        |                     |
|------------------------|---------------------|
| Application Number     | 11873186            |
| Filing Date            | 2007-10-16          |
| First Named Inventor   | Jim B. Surjaatmadja |
| Art Unit               | 3676                |
| Examiner Name          | Zakiya W. Bates     |
| Attorney Docket Number | 2006-IP-021186U1    |

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-08-25 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Acknowledgement Receipt   |                                                  |
|--------------------------------------|--------------------------------------------------|
| EFS ID:                              | 5945724                                          |
| Application Number:                  | 11873186                                         |
| International Application Number:    |                                                  |
| Confirmation Number:                 | 1172                                             |
| Title of Invention:                  | Method and System for Centralized Well Treatment |
| First Named Inventor/Applicant Name: | Jim B. Surjaatmadja                              |
| Customer Number:                     | 29920                                            |
| Filer:                               | Elizabeth L. Durham/Debbie Allen                 |
| Filer Authorized By:                 | Elizabeth L. Durham                              |
| Attorney Docket Number:              | 2006-IP-021186U1                                 |
| Receipt Date:                        | 25-AUG-2009                                      |
| Filing Date:                         | 16-OCT-2007                                      |
| Time Stamp:                          | 10:07:40                                         |
| Application Type:                    | Utility under 35 USC 111(a)                      |

### Payment information:

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|------------------------|----|
| Submitted with Payment | no |
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### File Listing:

| Document Number | Document Description                                    | File Name         | File Size(Bytes)/<br>Message Digest                | Multi Part /.zip | Pages (if appl.) |
|-----------------|---------------------------------------------------------|-------------------|----------------------------------------------------|------------------|------------------|
| 1               | Information Disclosure Statement (IDS)<br>Filed (SB/08) | 0637181162IDS.PDF | 117903<br>fa2bb294d6984e3b641060e6966f8215d2601512 | no               | 3                |

### Warnings:

### Information:

This is not an USPTO supplied IDS fillable form

Total Files Size (in bytes):

117903

**This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.**

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.                                                                  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.             | CONFIRMATION NO.            |
|----------------------------------------------------------------------------------|-------------|----------------------|---------------------------------|-----------------------------|
| 11/873,186                                                                       | 10/16/2007  | Jim B. Surjaatmadja  | 2006-IP-021186U1                | 1172                        |
| 29920 7590 10/05/2009<br>JOHN W. WUSTENBERG<br>P.O. BOX 1431<br>DUNCAN, OK 73536 |             |                      | EXAMINER<br>BATES, ZAKIYA W     |                             |
|                                                                                  |             |                      | ART UNIT<br>3676                | PAPER NUMBER                |
|                                                                                  |             |                      | NOTIFICATION DATE<br>10/05/2009 | DELIVERY MODE<br>ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JOHN.WUSTENBERG@HALLIBURTON.COM  
HOLLY.FINE@HALLIBURTON.COM

|                              |                                      |  |                                             |  |
|------------------------------|--------------------------------------|--|---------------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>11/873,186 |  | <b>Applicant(s)</b><br>SURJAATMADJA, JIM B. |  |
|                              | <b>Examiner</b><br>/Zakiya W. Bates/ |  | <b>Art Unit</b><br>3676                     |  |
|                              |                                      |  |                                             |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☒ Responsive to communication(s) filed on 12 June 2009.

2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 1-31 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1-31 is/are rejected.

7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.

8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All    b) ☐ Some \* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

|                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)<br>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)<br>3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____. | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____.<br>5) <input type="checkbox"/> Notice of Informal Patent Application<br>6) <input type="checkbox"/> Other: _____. |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## DETAILED ACTION

### *Double Patenting*

1. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1-31 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-33 and 40-43 of copending Application No. 11/291496. Although the conflicting claims are not identical, they are not patentably distinct from each other because although the claims of the '496 application are broader in scope than those of the instant invention, the claims of the two applications encompass the same subject matter, and therefore would have been obvious to one having ordinary skill in the art at the time the invention was made to include the claims within the same application in order to provide for broadened patent protection.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Response to Arguments***

3. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to /Zakiya W. Bates/ whose telephone number is (571) 272-7039. The examiner can normally be reached on Monday-Friday, 8:30 AM-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Gay can be reached on (571) 272-7029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zakiya W. Bates/  
Primary Examiner  
Art Unit 3676

zb  
9/29/09

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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|-----------------------------------------------------------------------------------------------------|------------------------|------------------|------------|--|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |  |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |  |
|                                                                                                     | First Named Inventor   | Surjaatmadja     |            |  |
|                                                                                                     | Art Unit               | 3676             |            |  |
|                                                                                                     | Examiner Name          | Zakiya W. Bates  |            |  |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |  |

| U.S.PATENTS                                                                                                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
|------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number                                                                                                                                                                                                                                                   | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       | 6644844                                                                                                                                                                                                                                                         |                           | 2003-11-11             | Neal, et al.                                    |                                                                        |                                                                        |                          |
| If you wish to add additional U.S. Patent citation information please click the Add button.                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| If you wish to add additional U.S. Published Application citation information please click the Add button. |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| FOREIGN PATENT DOCUMENTS                                                                                   |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup>                                                                                                                                                                                                                            | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        | <input type="checkbox"/> |
| If you wish to add additional Foreign Patent Document citation information please click the Add button     |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| NON-PATENT LITERATURE DOCUMENTS                                                                            |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initials*                                                                                         | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |                           |                        |                                                 |                                                                        |                                                                        | T <sup>5</sup>           |

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Surjaatmadja     |            |
|                                                                                                     | Art Unit               | 3676             |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates  |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |

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| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Office Action for U.S. Serial No. 11/291,496, dated May 19, 2009 | <input type="checkbox"/> |
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| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | /Zakiya Bates/ (09/29/2009)                                      | Date Considered          |
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|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |  |

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| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
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| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | /Zakiya Bates/ (09/29/2009) |  | Date Considered          |
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**EAST Search History****EAST Search History (Prior Art)**

| Ref # | Hits | Search Query                                                                                                                                                                                                                                                | DBs                                                     | Default Operator | Plurals | Time Stamp          |
|-------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------|---------|---------------------|
| L1    | 45   | ("2758653"   "20050121196"   "20050211439"   "20060185848"   "20070116546"   "20090050311"   "3062286"   "3537529"   "3933205"   "4050529"   "4733567"   "4974675"   "5111881"   "5494103"   "5499678"   "6729394"   "7225869"   "7431090"   "7445045").PN. | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2009/09/29<br>16:03 |
| L2    | 2    | ("6644844").PN.                                                                                                                                                                                                                                             | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2009/09/29<br>16:03 |
| L3    | 2    | ("20090194273").PN.                                                                                                                                                                                                                                         | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2009/09/29<br>16:04 |
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| L5    | 0    | 2 and 4                                                                                                                                                                                                                                                     | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2009/09/29<br>16:15 |
| L6    | 0    | 1 and 4                                                                                                                                                                                                                                                     | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2009/09/29<br>16:16 |

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Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

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|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

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| Examiner Initial* | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
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| *                  | 1       | <del>Office Action for U.S. Serial No. 11/990,916, dated April 26, 2009</del>                                                                                                                                                                                   | <input type="checkbox"/> |
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| <b>SERIAL NUMBER</b><br>11/873,186                                                                                                                                                                                                                                              | <b>FILING or 371(c)<br/>DATE</b><br>10/16/2007<br><b>RULE</b>                                                     | <b>CLASS</b><br>166                                      | <b>GROUP ART UNIT</b><br>3676                                                                                                                                                                                                                                             | <b>ATTORNEY DOCKET<br/>NO.</b><br>2006-IP-021186U1 |                               |                                    |
| <b>APPLICANTS</b><br>Jim B. Surjaatmadja, Duncan, OK;<br><b>** CONTINUING DATA *****</b><br><b>** FOREIGN APPLICATIONS *****</b><br><b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b><br>11/02/2007                                                                      |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                    |                               |                                    |
| Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Verified and Acknowledged <u>/ZAKIYA W BATES/</u><br>Examiner's Signature |                                                                                                                   | <input type="checkbox"/> Met after Allowance<br>Initials | <b>STATE OR<br/>COUNTRY</b><br>OK                                                                                                                                                                                                                                         | <b>SHEETS<br/>DRAWINGS</b><br>7                    | <b>TOTAL<br/>CLAIMS</b><br>31 | <b>INDEPENDENT<br/>CLAIMS</b><br>2 |
| <b>ADDRESS</b><br>JOHN W. WUSTENBERG<br>P.O. BOX 1431<br>DUNCAN, OK 73536<br>UNITED STATES                                                                                                                                                                                      |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                    |                               |                                    |
| <b>TITLE</b><br>Method and System for Centralized Well Treatment                                                                                                                                                                                                                |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                    |                               |                                    |
| <b>FILING FEE<br/>RECEIVED</b><br>1710                                                                                                                                                                                                                                          | FEES: Authority has been given in Paper<br>No. _____ to charge/credit DEPOSIT ACCOUNT<br>No. _____ for following: |                                                          | <input type="checkbox"/> All Fees<br><input type="checkbox"/> 1.16 Fees (Filing)<br><input type="checkbox"/> 1.17 Fees (Processing Ext. of time)<br><input type="checkbox"/> 1.18 Fees (Issue)<br><input type="checkbox"/> Other _____<br><input type="checkbox"/> Credit |                                                    |                               |                                    |

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| Examiner Initials*                                                                                         | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |                           |                        |                                                 |                                                                          |                                                                          | T <sup>5</sup>           |

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/Zakiya Bates/ (09/29/2009)

**EAST Search History****EAST Search History (Prior Art)**

| Ref # | Hits | Search Query    | DBs                                                  | Default Operator | Plurals | Time Stamp          |
|-------|------|-----------------|------------------------------------------------------|------------------|---------|---------------------|
| L7    | 2    | ("4715721").PN. | US-PGPUB;<br>USPAT; EPO;<br>JPO; DERWENT;<br>IBM_TDB | OR               | OFF     | 2009/09/29<br>16:18 |

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|-----------------------------------------------------------------------------------------------------|------------------------|----------------------|------------|--|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                      | 11873186   |  |
|                                                                                                     | Filing Date            |                      | 2007-10-16 |  |
|                                                                                                     | First Named Inventor   | Surjaatmadja         |            |  |
|                                                                                                     | Art Unit               | 3676                 |            |  |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |  |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |  |

| U.S.PATENTS       |         |               |                        |            |                                                 |                                                                          |
|-------------------|---------|---------------|------------------------|------------|-------------------------------------------------|--------------------------------------------------------------------------|
| Examiner Initial* | Cite No | Patent Number | Kind Code <sup>1</sup> | Issue Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
|                   | 1       | 4715721       |                        | 1987-12-29 | Walker, et al.                                  |                                                                          |

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| U.S.PATENT APPLICATION PUBLICATIONS |         |                    |                        |                  |                                                 |                                                                          |
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| Examiner Initial*                   | Cite No | Publication Number | Kind Code <sup>1</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
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| Examiner Initial*        | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
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| Examiner Initials*              | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>5</sup> |
|                                 |         |                                                                                                                                                                                                                                                                 |                |

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|                                                                                                     | Filing Date            |                      | 2007-10-16 |
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|                                                                                                     | Art Unit               | 3676                 |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W.     |            |
|                                                                                                     | Attorney Docket Number | HES 2006-IP-021186U1 |            |

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| 1 | Office Action for U.S. Serial No. 11/291,496, dated March 11, 2009 | <input type="checkbox"/> |
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| EXAMINER SIGNATURE |                             |                 |  |
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<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 07/31/2008. OMB 0651-0031

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676             |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W. |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |

| U.S.PATENTS                                                                                                |         |                                                                                                                                                                                                                                                                 |                            |                        |                                                 |                                                                        |                                                                        |
|------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number                                                                                                                                                                                                                                                   | Kind Code <sup>1</sup>     | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                            |                        |                                                 |                                                                        |                                                                        |
| If you wish to add additional U.S. Patent citation information please click the Add button.                |         |                                                                                                                                                                                                                                                                 |                            |                        |                                                 |                                                                        |                                                                        |
| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                                                                                                                                                                                                                                                 |                            |                        |                                                 |                                                                        |                                                                        |
| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>     | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                            |                        |                                                 |                                                                        |                                                                        |
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| FOREIGN PATENT DOCUMENTS                                                                                   |         |                                                                                                                                                                                                                                                                 |                            |                        |                                                 |                                                                        |                                                                        |
| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup>                                                                                                                                                                                                                            | Country Code <sup>2i</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                            |                        |                                                 |                                                                        |                                                                        |
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| Examiner Initials*                                                                                         | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |                            |                        |                                                 |                                                                        | T <sup>5</sup>                                                         |
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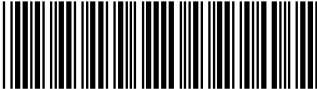
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|-----------------------------------------------------------------------------------------------------|------------------------|------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676             |            |
|                                                                                                     | Examiner Name          | Bates, Zakiya W. |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |

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| * | 1 | Office Action for U.S. Serial No. 11/753,314, dated May 5, 2009 | <input type="checkbox"/> |
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| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |  |                 |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | /Zakiya Bates/ (09/29/2009) |  | Date Considered |
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| <small> <sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.         </small> |                             |  |                 |

**\*Non-publish US applications considered for double patenting only.**

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| <b>Search Notes</b><br> | <b>Application/Control No.</b><br>11/873,186<br><b>Examiner</b><br>/Zakiya W. Bates/ | <b>Applicant(s)/Patent under Reexamination</b><br>SURJAATMADJA, JIM B.<br><b>Art Unit</b><br>3676 |
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| SEARCHED |          |      |          |
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| Class    | Subclass | Date | Examiner |
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| SEARCH NOTES<br>(INCLUDING SEARCH STRATEGY) |           |      |
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|                                             | DATE      | EXMR |
| East attached                               | 9/29/2009 | ZB   |
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Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

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|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

| U.S.PATENTS                                                                                                |         |                                      |                           |                        |                                                 |                                                                        |                                                                        |                          |
|------------------------------------------------------------------------------------------------------------|---------|--------------------------------------|---------------------------|------------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number                        | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       | 6991037                              |                           | 2006-01-31             | Hockinig                                        |                                                                        |                                                                        |                          |
|                                                                                                            | 2       | 7391675                              |                           | 2008-06-24             | Drew                                            |                                                                        |                                                                        |                          |
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| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                      |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Publication Number                   | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       |                                      |                           |                        |                                                 |                                                                        |                                                                        |                          |
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| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
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|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

| Examiner Initials*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>5</sup>           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1       | Office Action for U.S. Patent Application No. 11/873,160, dated October 1, 2009                                                                                                                                                                                 | <input type="checkbox"/> |
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| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |         |                                                                                                                                                                                                                                                                 |                          |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |         | Date Considered                                                                                                                                                                                                                                                 |                          |
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| <small> <sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.         </small> |         |                                                                                                                                                                                                                                                                 |                          |

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| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     | 11873186            |
|                                                                                                     | Filing Date            | 2007-10-16          |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |
|                                                                                                     | Art Unit               | 3676                |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |

### CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

### SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2009-10-09 |
| Name/Print | Melody Wirz                                                                         | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

| Electronic Patent Application Fee Transmittal |          |                                                  |        |                      |
|-----------------------------------------------|----------|--------------------------------------------------|--------|----------------------|
| Application Number:                           |          | 11873186                                         |        |                      |
| Filing Date:                                  |          | 16-Oct-2007                                      |        |                      |
| Title of Invention:                           |          | Method and System for Centralized Well Treatment |        |                      |
| First Named Inventor/Applicant Name:          |          | Jim B. Surjaatmadja                              |        |                      |
| Filer:                                        |          | Elizabeth L. Durham/Debbie Allen                 |        |                      |
| Attorney Docket Number:                       |          | 2006-IP-021186U1                                 |        |                      |
| Filed as Large Entity                         |          |                                                  |        |                      |
| Utility under 35 USC 111(a) Filing Fees       |          |                                                  |        |                      |
| Description                                   | Fee Code | Quantity                                         | Amount | Sub-Total in USD(\$) |
| Basic Filing:                                 |          |                                                  |        |                      |
| Pages:                                        |          |                                                  |        |                      |
| Claims:                                       |          |                                                  |        |                      |
| Miscellaneous-Filing:                         |          |                                                  |        |                      |
| Petition:                                     |          |                                                  |        |                      |
| Patent-Appeals-and-Interference:              |          |                                                  |        |                      |
| Post-Allowance-and-Post-Issuance:             |          |                                                  |        |                      |
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| Description                             | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
|-----------------------------------------|----------|----------|--------|----------------------|
| <b>Miscellaneous:</b>                   |          |          |        |                      |
| Submission- Information Disclosure Stmt | 1806     | 1        | 180    | 180                  |
| <b>Total in USD (\$)</b>                |          |          |        | <b>180</b>           |

| <b>Electronic Acknowledgement Receipt</b>   |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <b>EFS ID:</b>                              | 6233478                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Elizabeth L. Durham/Debbie Allen                 |
| <b>Filer Authorized By:</b>                 | Elizabeth L. Durham                              |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 09-OCT-2009                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 11:12:57                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

### **Payment information:**

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| Submitted with Payment                                                                                                                                                                                                                                                                             | yes             |
| Payment Type                                                                                                                                                                                                                                                                                       | Deposit Account |
| Payment was successfully received in RAM                                                                                                                                                                                                                                                           | \$180           |
| RAM confirmation Number                                                                                                                                                                                                                                                                            | 6962            |
| Deposit Account                                                                                                                                                                                                                                                                                    | 020383          |
| Authorized User                                                                                                                                                                                                                                                                                    |                 |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)<br>Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) |                 |

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

**File Listing:**

| Document Number | Document Description | File Name         | File Size(Bytes)/ Message Digest        | Multi Part /.zip | Pages (if appl.) |
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| 1               |                      | 0637181162IDS.pdf | 1837169                                 | yes              | 44               |
|                 |                      |                   | 4d3b7c6a3efcd19b47698e1fd30345fd1ad5ff0 |                  |                  |

**Multipart Description/PDF files in .zip description**

|  | Document Description                                 | Start | End |
|--|------------------------------------------------------|-------|-----|
|  | Information Disclosure Statement (IDS) Filed (SB/08) | 1     | 3   |
|  | NPL Documents                                        | 4     | 44  |
|  |                                                      |       |     |

**Warnings:**

**Information:**

|   |                         |              |                                         |    |   |
|---|-------------------------|--------------|-----------------------------------------|----|---|
| 2 | Fee Worksheet (PTO-875) | fee-info.pdf | 30110                                   | no | 2 |
|   |                         |              | 8cb245bcb75109796908e9803650b02a694e18f |    |   |

**Warnings:**

**Information:**

**Total Files Size (in bytes):** 1867279

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

|                                      |   |                                           |
|--------------------------------------|---|-------------------------------------------|
| In re Application of:                | § |                                           |
| <b>SURJAATMADJA</b>                  | § | Group Art Unit: <b>3676</b>               |
|                                      | § |                                           |
| Serial No.: <b>11/873,186</b>        | § | Confirmation No.: <b>1172</b>             |
|                                      | § |                                           |
| Filed: <b>OCTOBER 16, 2007</b>       | § | Examiner: <b>BATES, ZAKIYA W.</b>         |
|                                      | § |                                           |
| Title: <b>“METHOD AND SYSTEM FOR</b> | § |                                           |
| <b>CENTRALIZED WELL TREATMENT”</b>   | § | Atty. Docket No:                          |
|                                      | § | <b>HES 2006-IP-021186U1 (063718.1162)</b> |
|                                      | § |                                           |

## **LISTING OF THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **Claims:**

1. (Original) A method of providing centralized well development services to a plurality of wells, comprising the steps of:

flowing from a centralized well treatment fluid center to one or more centralized service factories one or more well development task fluids, wherein the one or more centralized service factories are selectively configurable to receive the one or more well development task fluids;

preparing, at the one or more centralized service factories, one or more well treatment fluids from the one or more well development task fluids, wherein the one or more centralized service factories are selectively configurable to prepare the one or more well treatment fluids;

flowing from the one or more centralized service factories to at least one of the plurality of wells the one or more well treatment fluids, wherein the one or more centralized service factories are selectively configurable to flow the one or more well treatment fluids;

recovering from the at least one of the plurality of wells the one or more well treatment fluids at the one or more centralized service factories, wherein the one or more centralized service factories are selectively configurable to receive the one or more recovered well treatment fluids; and

flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more recovered well treatment fluids, wherein the one or more centralized service factories are selectively configurable to flow the one or more recovered well treatment fluids, and wherein the centralized well treatment fluid center is selectively configurable to receive the one or more recovered well treatment fluids.

2. (Previously Presented) The method of claim 1, wherein at least two well development task fluids are provided and they comprise different compositions.
3. (Previously Presented) The method of claim 1, further comprising the step of:  
disposing of at least one of the one or more recovered well treatment fluids at the centralized well treatment fluid center, wherein the centralized well treatment fluid center is configurable to dispose of the at least one of the one or more recovered well treatment fluids.
4. (Previously Presented) The method of claim 1, further comprising the step of:  
reconditioning at least one of the one or more recovered well treatment fluids at the centralized well treatment fluid center, wherein the centralized well treatment fluid center is configurable to recondition the at least one of the one or more recovered well treatment fluids.
5. (Original) The method of claim 1, wherein at least one of the one or more well treatment fluids comprises a compound selected from the group consisting of drilling fluid, HMP, cement, gas, oil, water, proppant, fracturing fluid, gelling agents, friction reducers, acidizers, conformance fluids, cleaning fluids, brine, cutting abrasives and combinations thereof.
6. (Original) The method of claim 1, further comprising the steps of:  
receiving a production fluid at one or more of the one or more centralized service factories from the at least one of the plurality of wells, wherein the one or more of the one or more centralized service factories is configurable to receive the production fluid; and  
receiving the production fluid at the centralized well treatment fluid center from the one or more of the one or more centralized service factories, wherein the centralized well treatment fluid center is configurable to receive the production fluid from the one or more of the one or more centralized service factories.
7. (Previously Presented) The method of claim 6, further comprising the step of:

separating the production fluid into at least two or more second production fluids, wherein the centralized well treatment fluid center is configurable to separate the production fluid into at least two or more second production fluids.

8. (Original) The method of claim 7, further comprising the steps of:

conditioning the at least two or more second production fluids, wherein the centralized well treatment fluid center is configurable to condition the at least two or more second production fluids; and

disposing of at least one of the at least two or more second production fluids, wherein the centralized well treatment fluid center is configurable to dispose of the at least one of the at least two or more second production fluids.

9. (Original) The method of claim 7, further comprising:

flowing the at least two or more second production fluids to a distribution center, wherein the centralized well treatment fluid center is configurable to flow the at least two or more second production fluids to the distribution center.

10. (Original) The method of claim 1, further comprising the steps of:

flowing from the centralized well treatment fluid center to the one or more centralized service factories one or more other well development task fluids, wherein the one or more centralized service factories are selectively configurable to receive the one or more other well development task fluids;

flowing from the one or more centralized service factories to the at least one of the plurality of wells the one or more other well treatment fluids, wherein the one or more centralized service factories is selectively configurable to flow the one or more other well treatment fluids;

recovering from the at least one of the plurality of wells the one or more other well treatment fluids at the one or more centralized service factories, wherein the one or more centralized service factories are selectively configurable to receive the one or more recovered other well treatment fluids; and

flowing from the one or more centralized service factories to the centralized well treatment fluid center the one or more other recovered well treatment fluids, wherein the one or more centralized service factories are selectively configurable to flow the one or more other recovered well treatment fluids, and wherein the centralized well treat fluid center is selectively configurable to receive the one or more other recovered well treatment fluids.

11. (Previously Presented) The method of claim 1, further comprising the step of:

storing the one or more recovered well treatment fluids at the centralized well treatment fluid center, wherein the centralized well treatment fluid center is configurable to store the one or more recovered well treatment fluids.

12. (Previously Presented) The method of claim 1, further comprising the step of:

flowing from the centralized well treatment fluid center substantially simultaneously two or more well development task fluids to at least one of the one or more centralized service factories, wherein the centralized well treatment fluid center is configurable to flow substantially simultaneously the two or more well development task fluids, and wherein the at least one of the one or more centralized service factories are configurable to receive substantially simultaneously the two or more well development task fluids.

13. (Previously Presented) The method of claim 12, further comprising the step of:

flowing to a first well of the plurality of wells from the at least one of the one or more centralized service factories any of the one or more well treatment fluids prepared from the two or more well development task fluids substantially simultaneously with flowing to a second well of the plurality of wells from the at least one of the one or more centralized service factories any of the one or more well treatment fluids prepared from the two or more well development task fluids, wherein the at least one of the one or more centralized service factories is configurable to flow substantially simultaneously at least two of the one or more well treatment fluids.

14. (Previously Presented) The method of claim 1, further comprising the step of:

flowing from the centralized well treatment fluid center to the one or more centralized service factories the one or more well treatment fluids, wherein the one or more centralized service factories are selectively configurable to receive the one or more well treatment fluids.

15. (Previously Presented) The method of claim 1, further comprising the steps of:

flowing to two or more wells of the plurality of wells substantially simultaneously the one or more well treatment fluids from at least one of the one or more centralized service factories, wherein the at least one of the one or more centralized service factories is configurable to flow substantially simultaneously the one or more well treatment fluids to the two or more wells of the plurality of wells; and

recovering from the two or more wells of the plurality of wells substantially simultaneously the one or more well treatment fluids at the at least one of the one or more centralized service factories, wherein the at least one of the one or more centralized service factories is configured to recover substantially simultaneously the one or more well treatment fluids.

16. (Original) The method of claim 1, further comprising the steps of:

providing a first plurality of fluid lines from the centralized well treatment fluid center to a first centralized service factory, wherein the first plurality of fluid lines are adapted to flow the one or more well treatment fluids;

providing a second plurality of fluid lines from the centralized well treatment fluid center to the first centralized service factory, wherein the second plurality of fluid lines are adapted to flow the one or more recovered well treatment fluids;

providing a third plurality of fluid lines from the centralized well treatment fluid center to a second centralized service factory, wherein the third plurality of fluid lines are adapted to flow the one or more well treatment fluids; and

providing a fourth plurality of fluid lines from the centralized well treatment fluid center to the second centralized service factory, wherein the fourth plurality of fluid lines are adapted to flow the one or more recovered well treatment fluids.

17. (Previously Presented) A system for centralized distributing, receiving, and treating fluids for a plurality of wells, the system comprising:

a centralized well treatment fluid center;

one or more centralized service factories;

a plurality of distribution lines coupled between the centralized well treatment fluid center and the one or more centralized service factories, wherein the plurality of distribution lines are adapted to flow one or more well development task fluids; and

a plurality of return lines coupled between the centralized well treatment fluid center and the one or more centralized service factories, wherein the plurality of return lines are adapted to flow one or more recovered well treatment fluids.

18. (Previously Presented) The system of claim 17, further comprising:

a plurality of modules disposed about each of the one or more centralized service factories;

a first fluid flow line coupled between the at least one of the plurality of wells and any of the plurality of modules, wherein the first fluid flow line is adapted to flow one or more well treatment fluids to the at least one of the plurality of wells; and

a second fluid flow line coupled between the at least one of the plurality of wells and one or more of the plurality of modules, wherein the second fluid flow line is adapted to recover the one or more well treatment fluids from the at least one of the plurality of wells;

wherein a first configuration of the plurality of modules is operable to flow a first well treatment fluid to the at least one of the plurality of wells; and

wherein a second configuration of the plurality of modules is operable to flow a second well treatment fluid to the at least one of the plurality of wells.

19. (Original) The system of claim 17, wherein each of the plurality of distribution lines are adapted to flow one or more well treatment fluids.

20. (Original) The system of claim 17, wherein the centralized well treatment center is configurable to:

flow the one or more well development task fluids;  
receive the one or more recovered well treatment fluids;  
recondition the one or more recovered well treatment fluids; and  
receive production fluids.

21. (Original) The system of claim 17, wherein the one or more centralized service factories is configurable to:

receive the one or more well development task fluids from the centralized well treatment fluid center;

prepare the one or more well treatment fluids from the one or more well development task fluids;

flow the one or more well treatment fluids to the plurality of wells;

receive the one or more recovered well treatment fluids from the plurality of wells; and

receive production fluids from the plurality of wells.

22. (Original) The system of claim 17, wherein the plurality of modules comprise:

- one or more blending modules;
- one or more additive storage modules, wherein the one or more additive storage modules are operable to connect to the one or more blending modules;
- one or more liquid additive pumps, wherein the one or more liquid additive pumps are operable to connect to the one or more blending modules;
- one or more pumping grids, wherein the one or more pumping grids are operable to connect to the one or more blending modules;
- one or more manifolds, wherein the one or more manifolds are operable to connect to the one or more blending modules; and
- a power grid, wherein the power grid is operable to connect to the one or more blending modules, the one or more additive storage modules, the one or more liquid additive pumps, the one or more pumping grids, and the one or more manifolds.

23. (Original) The system of claim 22, further comprising:

- a third fluid flow line between at least one of a second plurality of wells and the one or more manifolds, wherein the third fluid flow line is directed to delivering at least one of the one or more well treatment fluids;
- wherein the one or more manifolds is operable to deliver substantially simultaneously any of the one or more well treatment fluids through the third fluid flow line and any of the one or more well treatment fluids through the second fluid flow line; and
- a fourth fluid flow line between the second plurality of wells and the one or more manifolds, wherein the fourth fluid flow line is directed to recovering the one or more well treatment fluids from the at least one of the second plurality of wells.

24. (Original) The system of claim 18, wherein at least one of the one or more modules is directed to reconditioning the one or more well treatment fluids substantially simultaneously with recovering the one or more well treatment fluids.

25. (Original) The system of claim 18, further comprising:

a fluid reconditioning module disposed about the centralized well treatment fluid center, wherein the fluid reconditioning module is operable to recondition at least one of the one or more recovered well treatment fluids; and

a fifth fluid flow line between the fluid reconditioning module and the third fluid flow line so as to receive the one or more recovered well treatment fluids from the at least one of the one or more centralized service factories.

26. (Original) The system of claim 25, further comprising:

a sixth fluid flow line between the fluid reconditioning module and any of the one or more modules so as to flow the reconditioned well treatment fluids to the one or more centralized service factories.

27. (Original) The system of claim 26, further comprising:

a seventh fluid flow line between the fluid reconditioning module and an additive storage module, wherein the additive storage module is operable to store the reconditioned well treatment fluids.

28. (Original) The system of claim 18, further comprising a disposal module coupled to at least one of the one or more modules, wherein the disposal module is operable to dispose of the recovered well treatment fluids.

29. (Original) The system of claim 18, further comprising a base coupled to at least one of the one or more modules, wherein the base is operable to move the at least one of the one or more modules.

30. (Original) The system of claim 18, further comprising a cleaning module coupled to at least one of the one or more modules, wherein the cleaning module is operable to clean any fluid flow line.

31. (Original) The system of claim 18, further comprising a production fluid module, wherein the production fluid module is operable to receive production fluid from at least one of the one or more centralized service factories.

## **REMARKS / ARGUMENTS**

### **I. Disposition of the Claims.**

Please consider the application in view of the following remarks. Applicant thanks the Examiner for the careful consideration of this application including the references that Applicant has submitted in this case.

At the time of the Office Action, claims 1-31 were pending in this application. Claims 1-31 stand rejected. Applicant respectfully requests reconsideration in light of the remarks contained herein.

### **II. Remarks Regarding Double-Patenting Rejections**

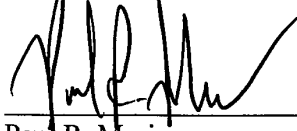
Claims 1-31 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-33 and 40-43 of copending Application No. 11/291,496. Although Applicant does not necessarily agree with the Examiner's rejection, Applicant submits herewith a properly executed terminal disclaimer in regard to claims 1-33 and 40-43 of copending Application No. 11/291,496. Accordingly, Applicant respectfully submits that the double-patenting rejection over this patent application has been overcome, and respectfully requests the withdrawal of these rejections.

## **SUMMARY**

In light of the above remarks, Applicant respectfully requests reconsideration and withdrawal of the outstanding rejections. Applicant further submits that the application is now in condition for allowance, and earnestly solicits timely notice of the same. Should the Examiner have any questions, comments or suggestions in furtherance of the prosecution of this application, the Examiner is invited to contact the attorney of record by telephone, facsimile, or electronic mail.

Applicant believes that no fees are due in association with the filing of this Response. However, should the Commissioner deem that any fees are due, including any fees for extensions of time, the Commissioner is authorized to debit Baker Botts L.L.P. Deposit Account No. 02-0383, Order Number 063718.1162, for any underpayment of fees that may be due in association with this filing.

Respectfully submitted,



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Telephone: 713.229.1732  
Facsimile: 713.229.7732  
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ATTORNEY FOR APPLICANT

Date: October 28, 2009

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

|                               |   |                                    |
|-------------------------------|---|------------------------------------|
| In re Application of:         | § |                                    |
| SURJAATMADJA                  | § | Group Art Unit: 3676               |
|                               | § |                                    |
| Serial No.: 11/873,186        | § | Confirmation No.: 1172             |
|                               | § |                                    |
| Filed: OCTOBER 16, 2007       | § | Examiner: BATES, ZAKIYA W.         |
|                               | § |                                    |
| Title: "METHOD AND SYSTEM FOR | § |                                    |
| CENTRALIZED WELL TREATMENT"   | § | Atty. Docket No:                   |
|                               | § | HES 2006-IP-021186U1 (063718.1162) |

**TERMINAL DISCLAIMER**

Dear Honorable Commissioner:

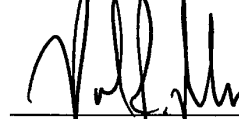
Halliburton Energy Services, Inc., the owner of all right, title and interest in and to the above patent application and in and of U.S. Patent Application Serial No. 11/291,496 (hereinafter the "'496 Application") hereby disclaims, under the provisions of 37 C.F.R. § 1.321, the terminal part of any patent granted on the above-identified patent application that would extend beyond the expiration date of any patent issuing from the '496 Application.

Applicant also hereby agrees that any patent so granted on the above-identified application shall be enforceable only for and during such period that the legal title to said patent shall be the same as any patent issuing from the '496 Application, this agreement to run with any patent granted on the above-identified application and to be binding upon the grantee, their successors and assigns.

In making the above disclaimer, Applicant does not disclaim the terminal part of any patent granted on the instant application that would extend to the expiration date of the full statutory term, as defined in 35 U.S.C. §§ 154-156 and 173, of any patent issuing from the '496 Application, as presently shortened by any terminal disclaimer filed prior to the patent grant, in the event that any such granted patent expires for failure to pay a maintenance fee, is held unenforceable, is found invalid by a court of competent jurisdiction, is statutorily disclaimed in whole or is terminally disclaimed under 37 C.F.R. § 1.321, has all claims canceled by a reexamination certificate, is reissued or is in any manner terminated prior to the expiration of its full statutory term as shortened by any terminal disclaimer filed prior to its grant.

The undersigned is an attorney of record in the present case.

Respectfully submitted,



---

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ATTORNEY FOR APPLICANT

Date: October 28, 2009

| Electronic Patent Application Fee Transmittal  |                 |                                                  |               |                             |
|------------------------------------------------|-----------------|--------------------------------------------------|---------------|-----------------------------|
| <b>Application Number:</b>                     |                 | 11873186                                         |               |                             |
| <b>Filing Date:</b>                            |                 | 16-Oct-2007                                      |               |                             |
| <b>Title of Invention:</b>                     |                 | Method and System for Centralized Well Treatment |               |                             |
| <b>First Named Inventor/Applicant Name:</b>    |                 | Jim B. Surjaatmadja                              |               |                             |
| <b>Filer:</b>                                  |                 | Elizabeth L. Durham/Debbie Allen                 |               |                             |
| <b>Attorney Docket Number:</b>                 |                 | 2006-IP-021186U1                                 |               |                             |
| Filed as Large Entity                          |                 |                                                  |               |                             |
| <b>Utility under 35 USC 111(a) Filing Fees</b> |                 |                                                  |               |                             |
| <b>Description</b>                             | <b>Fee Code</b> | <b>Quantity</b>                                  | <b>Amount</b> | <b>Sub-Total in USD(\$)</b> |
| <b>Basic Filing:</b>                           |                 |                                                  |               |                             |
| <b>Pages:</b>                                  |                 |                                                  |               |                             |
| <b>Claims:</b>                                 |                 |                                                  |               |                             |
| <b>Miscellaneous-Filing:</b>                   |                 |                                                  |               |                             |
| <b>Petition:</b>                               |                 |                                                  |               |                             |
| <b>Patent-Appeals-and-Interference:</b>        |                 |                                                  |               |                             |
| <b>Post-Allowance-and-Post-Issuance:</b>       |                 |                                                  |               |                             |
| Statutory disclaimer                           | 1814            | 1                                                | 140           | 140                         |
| <b>Extension-of-Time:</b>                      |                 |                                                  |               |                             |

| Description       | Fee Code | Quantity | Amount | Sub-Total in USD(\$) |
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| Miscellaneous:    |          |          |        |                      |
| Total in USD (\$) |          |          |        | 140                  |

| <b>Electronic Acknowledgement Receipt</b>   |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <b>EFS ID:</b>                              | 6347805                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Elizabeth L. Durham/Debbie Allen                 |
| <b>Filer Authorized By:</b>                 | Elizabeth L. Durham                              |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 28-OCT-2009                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 15:31:09                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

### **Payment information:**

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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Submitted with Payment                                                                                                                                                                                                                                                                             | yes             |
| Payment Type                                                                                                                                                                                                                                                                                       | Deposit Account |
| Payment was successfully received in RAM                                                                                                                                                                                                                                                           | \$140           |
| RAM confirmation Number                                                                                                                                                                                                                                                                            | 1816            |
| Deposit Account                                                                                                                                                                                                                                                                                    | 020383          |
| Authorized User                                                                                                                                                                                                                                                                                    |                 |
| The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:<br>Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)<br>Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) |                 |

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

**File Listing:**

| Document Number | Document Description | File Name         | File Size(Bytes)/<br>Message Digest                | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------|----------------------------------------------------|------------------|------------------|
| 1               |                      | 0637181162ROA.PDF | 599894<br>2a94b421ab5a502c5f3e01b7640b921328f4b273 | yes              | 19               |

**Multipart Description/PDF files in .zip description**

| Document Description                                  | Start | End |
|-------------------------------------------------------|-------|-----|
| Miscellaneous Incoming Letter                         | 1     | 2   |
| Amendment/Req. Reconsideration-After Non-Final Reject | 3     | 3   |
| Claims                                                | 4     | 15  |
| Applicant Arguments/Remarks Made in an Amendment      | 16    | 17  |
| Terminal Disclaimer Filed                             | 18    | 19  |

**Warnings:**

**Information:**

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|---|-------------------------|--------------|---------------------------------------------------|----|---|

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**Total Files Size (in bytes):** 630002

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**New Applications Under 35 U.S.C. 111**

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

**National Stage of an International Application under 35 U.S.C. 371**

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

**New International Application Filed with the USPTO as a Receiving Office**

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|                                      |   |                                           |
|--------------------------------------|---|-------------------------------------------|
| In re Application of:                | § |                                           |
| <b>SURJAATMADJA</b>                  | § | Group Art Unit: <b>3676</b>               |
|                                      | § |                                           |
| Serial No.: <b>11/873,186</b>        | § | Confirmation No.: <b>1172</b>             |
|                                      | § |                                           |
| Filed: <b>OCTOBER 16, 2007</b>       | § | Examiner: <b>BATES, ZAKIYA W.</b>         |
|                                      | § |                                           |
| Title: <b>“METHOD AND SYSTEM FOR</b> | § |                                           |
| <b>CENTRALIZED WELL TREATMENT”</b>   | § | Atty. Docket No:                          |
|                                      | § | <b>HES 2006-IP-021186U1 (063718.1162)</b> |

CERTIFICATE OF FILING ELECTRONICALLY VIA EFS MPEP  
503

I HEREBY CERTIFY THAT I HAVE A REASONABLE BASIS FOR BELIEF THAT THIS CORRESPONDENCE IS BEING SUBMITTED TO THE UNITED STATES PATENT AND TRADEMARK OFFICE VIA EFS (ELECTRONICALLY) ON THE DATE INDICATED BELOW, AND IS ADDRESSED TO:

MAIL STOP AMENDMENT  
HONORABLE COMMISSIONER FOR PATENTS  
PO BOX 1450  
ALEXANDRIA, VA 22313-1450

Debbie Allen  
DEBBIE ALLEN

**DATE OF SUBMISSION: OCTOBER 28, 2009**  
**ELECTRONIC FILING (EFS)**

Dear Honorable Commissioner:

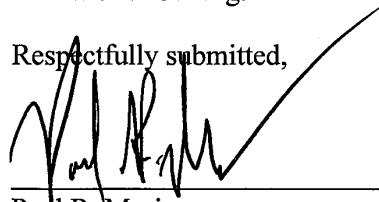
Applicant hereby submits the following documents to be filed with the United States Patent and Trademark Office:

- Response to Office Action mailed on October 5, 2009 under 37 C.F.R. § 1.111.
- Terminal Disclaimer Under 37 C.F.R. § 1.321.

The Commissioner is hereby authorized to debit Baker Botts L.L.P.'s Deposit Account No. 02-0383, Order Number 063718.1162, in the amount of \$130.00 for the terminal disclaimer fee under 37 C.F.R. § 1.20(d). Applicant believes that there are no additional fees due in association with the filing of this Response. However, should the Commissioner deem that any fees are due, including any fees for extensions of time, the Commissioner is authorized to

debit the Deposit Account of Baker Botts L.L.P., No. 02-0383, order number 063718.1162, for any underpayment of fees that may be due in association with this filing.

Respectfully submitted,



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Paul R. Morico  
Registration No. 35,960  
One Shell Plaza  
910 Louisiana Street  
Houston, Texas 77002-4995  
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Facsimile: 713.229.7732  
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ATTORNEY FOR APPLICANT

Date: October 28, 2009

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| <b>PATENT APPLICATION FEE DETERMINATION RECORD</b><br>Substitute for Form PTO-875                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                               |                                    |                                    |               | Application or Docket Number<br><b>11/873,186</b> |                                          | Filing Date<br><b>10/16/2007</b> |                         | <input type="checkbox"/> To be Mailed |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------|---------------|---------------------------------------------------|------------------------------------------|----------------------------------|-------------------------|---------------------------------------|--|
| <b>APPLICATION AS FILED – PART I</b>                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                               |                                    | (Column 2)                         |               |                                                   | SMALL ENTITY <input type="checkbox"/> OR |                                  | OTHER THAN SMALL ENTITY |                                       |  |
| FOR                                                                                                                                                                                                                                                                                                                                                                                                                                  | NUMBER FILED                                                                                                                                                                                                                  | NUMBER EXTRA                       | RATE (\$)                          | FEE (\$)      | OR                                                | RATE (\$)                                | FEE (\$)                         |                         |                                       |  |
| <input type="checkbox"/> BASIC FEE<br>(37 CFR 1.16(a), (b), or (c))                                                                                                                                                                                                                                                                                                                                                                  | N/A                                                                                                                                                                                                                           | N/A                                | N/A                                |               |                                                   | N/A                                      |                                  |                         |                                       |  |
| <input type="checkbox"/> SEARCH FEE<br>(37 CFR 1.16(k), (i), or (m))                                                                                                                                                                                                                                                                                                                                                                 | N/A                                                                                                                                                                                                                           | N/A                                | N/A                                |               |                                                   | N/A                                      |                                  |                         |                                       |  |
| <input type="checkbox"/> EXAMINATION FEE<br>(37 CFR 1.16(o), (p), or (q))                                                                                                                                                                                                                                                                                                                                                            | N/A                                                                                                                                                                                                                           | N/A                                | N/A                                |               |                                                   | N/A                                      |                                  |                         |                                       |  |
| TOTAL CLAIMS<br>(37 CFR 1.16(i))                                                                                                                                                                                                                                                                                                                                                                                                     | minus 20 =                                                                                                                                                                                                                    | *                                  | X \$ =                             |               | OR                                                | X \$ =                                   |                                  |                         |                                       |  |
| INDEPENDENT CLAIMS<br>(37 CFR 1.16(h))                                                                                                                                                                                                                                                                                                                                                                                               | minus 3 =                                                                                                                                                                                                                     | *                                  | X \$ =                             |               |                                                   | X \$ =                                   |                                  |                         |                                       |  |
| <input type="checkbox"/> APPLICATION SIZE FEE<br>(37 CFR 1.16(s))                                                                                                                                                                                                                                                                                                                                                                    | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| <input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| * If the difference in column 1 is less than zero, enter "0" in column 2.                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| TOTAL                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                               |                                    | TOTAL                              |               |                                                   |                                          |                                  |                         |                                       |  |
| <b>APPLICATION AS AMENDED – PART II</b>                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                               |                                    | (Column 2)                         |               |                                                   | SMALL ENTITY OR                          |                                  | OTHER THAN SMALL ENTITY |                                       |  |
| AMENDMENT                                                                                                                                                                                                                                                                                                                                                                                                                            | 10/28/2009                                                                                                                                                                                                                    | CLAIMS REMAINING AFTER AMENDMENT   | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | RATE (\$)                                         | ADDITIONAL FEE (\$)                      | OR                               | RATE (\$)               | ADDITIONAL FEE (\$)                   |  |
| Total (37 CFR 1.16(i))                                                                                                                                                                                                                                                                                                                                                                                                               | *                                                                                                                                                                                                                             | 31                                 | Minus                              | ** 31         | =                                                 | 0                                        | OR                               | X \$52=                 | 0                                     |  |
| Independent (37 CFR 1.16(h))                                                                                                                                                                                                                                                                                                                                                                                                         | *                                                                                                                                                                                                                             | 2                                  | Minus                              | *** 3         | =                                                 | 0                                        | OR                               | X \$220=                | 0                                     |  |
| <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| TOTAL ADD'L FEE                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                               |                                    | TOTAL ADD'L FEE                    |               |                                                   | 0                                        |                                  |                         |                                       |  |
| (Column 1)                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                               |                                    | (Column 2)                         |               |                                                   | SMALL ENTITY OR                          |                                  | OTHER THAN SMALL ENTITY |                                       |  |
| AMENDMENT                                                                                                                                                                                                                                                                                                                                                                                                                            | CLAIMS REMAINING AFTER AMENDMENT                                                                                                                                                                                              | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA                      | RATE (\$)     | ADDITIONAL FEE (\$)                               | OR                                       | RATE (\$)                        | ADDITIONAL FEE (\$)     |                                       |  |
| Total (37 CFR 1.16(i))                                                                                                                                                                                                                                                                                                                                                                                                               | *                                                                                                                                                                                                                             | Minus                              | **                                 | =             | X \$ =                                            | OR                                       | X \$ =                           |                         |                                       |  |
| Independent (37 CFR 1.16(h))                                                                                                                                                                                                                                                                                                                                                                                                         | *                                                                                                                                                                                                                             | Minus                              | ***                                | =             | X \$ =                                            | OR                                       | X \$ =                           |                         |                                       |  |
| <input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| <input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |
| TOTAL ADD'L FEE                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                               |                                    | TOTAL ADD'L FEE                    |               |                                                   |                                          |                                  |                         |                                       |  |
| <p>* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.</p> <p>** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".</p> <p>*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".</p> <p>The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.</p> |                                                                                                                                                                                                                               |                                    |                                    |               |                                                   |                                          |                                  |                         |                                       |  |

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Legal Instrument Examiner:  
/MONIQUE BRUNSON/

Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

Approved for use through 07/31/2008. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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|                                                                                                     |                        |                     |            |
|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

| U.S.PATENTS                                                                                                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
|------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number                                                                                                                                                                                                                                                   | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| If you wish to add additional U.S. Patent citation information please click the Add button.                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| If you wish to add additional U.S. Published Application citation information please click the Add button. |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| FOREIGN PATENT DOCUMENTS                                                                                   |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup>                                                                                                                                                                                                                            | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|                                                                                                            | 1       |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        | <input type="checkbox"/> |
| If you wish to add additional Foreign Patent Document citation information please click the Add button     |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| NON-PATENT LITERATURE DOCUMENTS                                                                            |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initials*                                                                                         | Cite No | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. |                           |                        |                                                 |                                                                        |                                                                        | T <sup>5</sup>           |

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|                                                                                                     |                        |                     |            |
|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|------------|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                 |                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------|
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | International Preliminary Report on Patentability from PCT/GB2008/001044, dated October 8, 2009 | <input type="checkbox"/> |
| If you wish to add additional non-patent literature document citation information please click the Add button                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                 |                          |
| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                 |                          |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                 | Date Considered          |
| *EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                 |                          |
| <small> <sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.         </small> |                                                                                                 |                          |

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

|                        |                     |
|------------------------|---------------------|
| Application Number     | 11873186            |
| Filing Date            | 2007-10-16          |
| First Named Inventor   | Jim B. Surjaatmadja |
| Art Unit               | 3676                |
| Examiner Name          | Zakiya W. Bates     |
| Attorney Docket Number | 2006-IP-021186U1    |

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

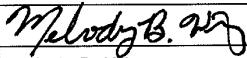
**OR**

- ☒ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |            |
|------------|-------------------------------------------------------------------------------------|---------------------|------------|
| Signature  |  | Date (YYYY-MM-DD)   | 2007-11-30 |
| Name/Print | Melody B. Wirz                                                                      | Registration Number | 53,783     |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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21 OCT 2009

CURTIS, Philip, Anthony  
A.A. Thornton & Co.  
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London WC1V 7LE  
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PRELIMINARY REPORT ON PATENTABILITY  
(CHAPTER I OF THE PATENT COOPERATION  
TREATY)

(PCT Rule 44bis.1(c))

|                                                                  |                                                                          |                                                              |
|------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------|
| Date of mailing (day/month/year)<br>08 October 2009 (08.10.2009) |                                                                          |                                                              |
| Applicant's or agent's file reference<br>PAC/26944WO             |                                                                          | IMPORTANT NOTICE                                             |
| International application No.<br>PCT/GB2008/001044               | International filing date (day/month/year)<br>27 March 2008 (27.03.2008) | Priority date (day/month/year)<br>27 March 2007 (27.03.2007) |
| Applicant<br>HALLIBURTON ENERGY SERVICES, INC, et al             |                                                                          |                                                              |

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

RECORDS  
NOTED

|                                                                                               |                                          |
|-----------------------------------------------------------------------------------------------|------------------------------------------|
| The International Bureau of WIPO<br>34, chemin des Colombettes<br>1211 Geneva 20, Switzerland | Authorized officer<br>Dorothee Mülhausen |
| Facsimile No. +41 22 338 82 70                                                                | e-mail: pt01.pct@wipo.int                |

Form PCT/IB/326 (January 2004)

# PATENT COOPERATION TREATY

# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

|                                                                                                                                  |                                                                                   |                                                                       |                  |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------|
| Applicant's or agent's file reference<br>PAC/26944WO                                                                             | <b>FOR FURTHER ACTION</b>                                                         |                                                                       | See item 4 below |
| International application No.<br>PCT/GB2008/001044                                                                               | International filing date ( <i>day/month/year</i> )<br>27 March 2008 (27.03.2008) | Priority date ( <i>day/month/year</i> )<br>27 March 2007 (27.03.2007) |                  |
| International Patent Classification (8th edition unless older edition indicated)<br>See relevant information in Form PCT/ISA/237 |                                                                                   |                                                                       |                  |
| Applicant<br>HALLIBURTON ENERGY SERVICES, INC.                                                                                   |                                                                                   |                                                                       |                  |

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                 |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------|--------------------------|------------|----------|--------------------------|-------------|--------------------------------------------------------------------------------------------------|--------------------------|------------|----------------------------|-------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------|-------------------------|-------------------------------------|-------------|--------------------------------------------------|-------------------------------------|--------------|-------------------------------------------------------|
| 1.                                  | This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                 |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| 2.                                  | This REPORT consists of a total of 6 sheets, including this cover sheet.<br><br>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                 |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| 3.                                  | <p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> | <input checked="" type="checkbox"/>                                                                                                                             | Box No. I | Basis of the report | <input type="checkbox"/> | Box No. II | Priority | <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability | <input type="checkbox"/> | Box No. IV | Lack of unity of invention | <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement | <input type="checkbox"/> | Box No. VI | Certain documents cited | <input checked="" type="checkbox"/> | Box No. VII | Certain defects in the international application | <input checked="" type="checkbox"/> | Box No. VIII | Certain observations on the international application |
| <input checked="" type="checkbox"/> | Box No. I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Basis of the report                                                                                                                                             |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input type="checkbox"/>            | Box No. II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Priority                                                                                                                                                        |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input type="checkbox"/>            | Box No. III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability                                                                |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input type="checkbox"/>            | Box No. IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Lack of unity of invention                                                                                                                                      |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input type="checkbox"/>            | Box No. VI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Certain documents cited                                                                                                                                         |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. VII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Certain defects in the international application                                                                                                                |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| <input checked="" type="checkbox"/> | Box No. VIII                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Certain observations on the international application                                                                                                           |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |
| 4.                                  | The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                 |           |                     |                          |            |          |                          |             |                                                                                                  |                          |            |                            |                                     |           |                                                                                                                                                                 |                          |            |                         |                                     |             |                                                  |                                     |              |                                                       |

|                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                       |                                                                   |                                              |                           |
|-------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------|---------------------------|
| The International Bureau of WIPO<br>34, chemin des Colombettes<br>1211 Geneva 20, Switzerland<br><br>Facsimile No. +41 22 338 82 70 | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Date of issuance of this report<br/>29 September 2009 (29.09.2009)</td> </tr> <tr> <td style="padding: 2px;">Authorized officer<br/><br/>Dorothee Mülhausen</td> </tr> <tr> <td style="padding: 2px;">e-mail: pt01.pct@wipo.int</td> </tr> </table> | Date of issuance of this report<br>29 September 2009 (29.09.2009) | Authorized officer<br><br>Dorothee Mülhausen | e-mail: pt01.pct@wipo.int |
| Date of issuance of this report<br>29 September 2009 (29.09.2009)                                                                   |                                                                                                                                                                                                                                                                                                                                                       |                                                                   |                                              |                           |
| Authorized officer<br><br>Dorothee Mülhausen                                                                                        |                                                                                                                                                                                                                                                                                                                                                       |                                                                   |                                              |                           |
| e-mail: pt01.pct@wipo.int                                                                                                           |                                                                                                                                                                                                                                                                                                                                                       |                                                                   |                                              |                           |

Form PCT/IB/373 (January 2004)

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43*bis*.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/GB2008/001044

International filing date (day/month/year)  
27.03.2008

Priority date (day/month/year)  
27.03.2007

International Patent Classification (IPC) or both national classification and IPC  
INV. E21B21/06 E21B43/26

Applicant  
HALLIBURTON ENERGY SERVICES, INC.

1. This opinion contains indications relating to the following items:

- |                                                  |                                                                                                                                                                       |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Box No. I    | Basis of the opinion                                                                                                                                                  |
| <input type="checkbox"/> Box No. II              | Priority                                                                                                                                                              |
| <input type="checkbox"/> Box No. III             | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability                                                                      |
| <input type="checkbox"/> Box No. IV              | Lack of unity of invention                                                                                                                                            |
| <input checked="" type="checkbox"/> Box No. V    | Reasoned statement under Rule 43b/s.1 (a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI              | Certain documents cited                                                                                                                                               |
| <input checked="" type="checkbox"/> Box No. VII  | Certain defects in the international application                                                                                                                      |
| <input checked="" type="checkbox"/> Box No. VIII | Certain observations on the international application                                                                                                                 |

## 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Date of completion of  
this opinion

see form  
PCT/ISA/210

Authorized Officer

Georgescu, Mihnea

Telephone No. +49 89 2399-7502



Form (PCT/SA/237) (Cover Sheet) (April 2005)

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2008/001044

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**Box No. I. Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of:
  - ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ on paper
    - ☐ in electronic form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in electronic form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/GB2008/001044

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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

|                               |             |             |
|-------------------------------|-------------|-------------|
| Novelty (N)                   | Yes: Claims | <u>1-14</u> |
|                               | No: Claims  |             |
| Inventive step (IS)           | Yes: Claims |             |
|                               | No: Claims  | <u>1-14</u> |
| Industrial applicability (IA) | Yes: Claims | <u>1-14</u> |
|                               | No: Claims  |             |

2. Citations and explanations

see separate sheet

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**Box No. VII Certain defects in the international application**

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The following defects in the form or contents of the international application have been noted:

see separate sheet

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**Box No. VIII Certain observations on the international application**

---

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Reference is made to the following documents:

D1: US 5 365 435  
D2: WO 2006/109035  
D3: US 5 281 023

**V - Reasoned statement with regard to novelty, inventive step or industrial applicability**

**V-1 Claims 1 to 14**

D1, which is considered as the closest prior art, describes a method for controlling the production of well treatment fluid (column 1, lines 7-11) comprising:  
determining an output rate from a sand system (column 3, lines 22, as the input of sand to the blender tub is equal to the output of the sand system);  
sensing an output rate for a water system (column 3, line 20);  
sensing an output rate from a pumping system (column 4, lines 52-53);  
sensing the height within a blender tub of a mixture of sand from the sand system and water from the water system (column 4, lines 51-52);  
producing a drive signal to the pumping system using a desired rate of well treatment fluid to be delivered to a well, the output rate of the sand system, the output rate of the water system, and the output rate of the pumping system (column 5, lines 35-46).

The distinguishing feature of claim 1 with regard to D1 is the presence of a virtual rate control system.

The subject-matter of claim 1 is therefore new and the claim meets the novelty requirements of Art. 33(2)PCT.

The meaning of the distinguishing feature of claim 1 is unclear as the term "system" is considered describing a device which is supposed to comprise structural features, and the term "virtual" excludes a structural feature. Consequently, claim 1 does not meet the requirement of Art. 6 PCT since the scope of protection of the claim cannot be unambiguously determined. Thus, a problem-solution approach cannot be formulated and a solution to a technical

problem cannot be seen in the distinguishing feature of claim 1. Therefore, an inventive step could not be acknowledged and the claim does not meet the requirement for inventive step of Art. 33(3) PCT.

Similar arguments apply to the independent claim 8 and to the respective dependent claims 2 to 7 and 9 to 14 which inherit the clarity problem present in the independent claims.

Should the applicant amend the aforementioned claims in the direction of describing the virtual system as a software, his attention is drawn to the following:

- 1) D1 comprises also a software (column 5, line 43) which runs the mixing system and modifies its parameters in order to obtain a treatment fluid closer to a mathematical model
- 2) the amendment should not infringe Art 34(2)(b) PCT.

#### **VII - Certain defects**

- VII-1 The independent claims are not properly cast in the two part form, with those features which in combination are part of the closest prior art (D1) being placed in the preamble, contrary to the requirements of Rule 6.3(b) PCT.
- VII-2 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- VII-3 Contrary to the requirements of Rule 5.1(a)(ii)PCT, the relevant background art disclosed in document D1 is not mentioned in the description, nor is this document identified therein.

#### **VIII - Certain observations (clarity)**

- VIII-1 See objection on point V-1.

| Electronic Acknowledgement Receipt          |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <b>EFS ID:</b>                              | 6534292                                          |
| <b>Application Number:</b>                  | 11873186                                         |
| <b>International Application Number:</b>    |                                                  |
| <b>Confirmation Number:</b>                 | 1172                                             |
| <b>Title of Invention:</b>                  | Method and System for Centralized Well Treatment |
| <b>First Named Inventor/Applicant Name:</b> | Jim B. Surjaatmadja                              |
| <b>Customer Number:</b>                     | 29920                                            |
| <b>Filer:</b>                               | Elizabeth L. Durham/Debbie Allen                 |
| <b>Filer Authorized By:</b>                 | Elizabeth L. Durham                              |
| <b>Attorney Docket Number:</b>              | 2006-IP-021186U1                                 |
| <b>Receipt Date:</b>                        | 30-NOV-2009                                      |
| <b>Filing Date:</b>                         | 16-OCT-2007                                      |
| <b>Time Stamp:</b>                          | 10:37:16                                         |
| <b>Application Type:</b>                    | Utility under 35 USC 111(a)                      |

**Payment information:**

|                        |    |
|------------------------|----|
| Submitted with Payment | no |
|------------------------|----|

**File Listing:**

| Document Number | Document Description | File Name         | File Size(Bytes)/<br>Message Digest      | Multi Part /.zip | Pages (if appl.) |
|-----------------|----------------------|-------------------|------------------------------------------|------------------|------------------|
| 1               |                      | 0637181162ids.PDF | 433067                                   | yes              | 10               |
|                 |                      |                   | 140717688e0d9f25b699f8a5b588d24de1122f93 |                  |                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Multipart Description/PDF files in .zip description  |        |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------|-----|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Document Description                                 | Start  | End |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Information Disclosure Statement (IDS) Filed (SB/08) | 1      | 3   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | NPL Documents                                        | 4      | 10  |
| <b>Warnings:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                      |        |     |
| <b>Information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                      |        |     |
| Total Files Size (in bytes):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                      | 433067 |     |
| <p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><b><u>New Applications Under 35 U.S.C. 111</u></b><br/> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><b><u>National Stage of an International Application under 35 U.S.C. 371</u></b><br/> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><b><u>New International Application Filed with the USPTO as a Receiving Office</u></b><br/> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p> |                                                      |        |     |

|                                                                                                                |                                              |                                                                        |  |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------|--|
| <b>Application Number</b><br> | <b>Application/Control No.</b><br>11/873,186 | <b>Applicant(s)/Patent under Reexamination</b><br>SURJAATMADJA, JIM B. |  |
| <b>Document Code - DISQ</b>                                                                                    |                                              | <b>Internal Document – DO NOT MAIL</b>                                 |  |

|                                |                                                       |                                                 |
|--------------------------------|-------------------------------------------------------|-------------------------------------------------|
| <b>TERMINAL<br/>DISCLAIMER</b> | <input type="checkbox"/> APPROVED                     | <input checked="" type="checkbox"/> DISAPPROVED |
| Date Filed : 10/28/09          | This patent is subject<br>to a Terminal<br>Disclaimer |                                                 |

|                                                                                            |
|--------------------------------------------------------------------------------------------|
| <b>Approved/Disapproved by:</b>                                                            |
| Janice Ford<br><br>legal title...not accepted must state commonly owned 37 CFR 1.321(c)(3) |

U.S. Patent and Trademark Office



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www.uspto.gov

|                                                                                  |             |                      |                                 |                             |
|----------------------------------------------------------------------------------|-------------|----------------------|---------------------------------|-----------------------------|
| APPLICATION NO.                                                                  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.             | CONFIRMATION NO.            |
| 11/873,186                                                                       | 10/16/2007  | Jim B. Surjaatmadja  | 2006-IP-021186U1                | 1172                        |
| 29920 7590 01/25/2010<br>JOHN W. WUSTENBERG<br>P.O. BOX 1431<br>DUNCAN, OK 73536 |             |                      | EXAMINER<br>BATES, ZAKIYA W     |                             |
|                                                                                  |             |                      | ART UNIT<br>3676                | PAPER NUMBER                |
|                                                                                  |             |                      | NOTIFICATION DATE<br>01/25/2010 | DELIVERY MODE<br>ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JOHN.WUSTENBERG@HALLIBURTON.COM  
HOLLY.FINE@HALLIBURTON.COM

|                              |                        |  |                      |  |
|------------------------------|------------------------|--|----------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> |  | <b>Applicant(s)</b>  |  |
|                              | 11/873,186             |  | SURJAATMADJA, JIM B. |  |
|                              | <b>Examiner</b>        |  | <b>Art Unit</b>      |  |
|                              | /Zakiya W. Bates/      |  | 3676                 |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) ☐ Responsive to communication(s) filed on \_\_\_\_.

2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) ☒ Claim(s) 1-31 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.

5) ☐ Claim(s) \_\_\_\_ is/are allowed.

6) ☒ Claim(s) 1-15, 17-21, 24, 28, 29 and 31 is/are rejected.

7) ☒ Claim(s) 16, 22, 23, 25-27 and 30 is/are objected to.

8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All    b) ☐ Some \*    c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.

4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Terminal Disclaimer***

1. The terminal disclaimer filed on 10/28/09 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of *any patent granted on Application Number 11/291496* has been reviewed and is NOT accepted.
2. The terminal disclaimer does not comply with 37 CFR 1.321(b) and/or (c) because:

It does not include a recitation that any patent granted shall be enforceable only for and during such period that said patent is commonly owned with the application(s) or patent(s) which formed the basis for the double patenting rejection. See 37 CFR 1.321(c)(3).

### ***Claim Objections***

3. Claims 25-27 are objected to because of the following informalities: claim 25 should depend from claim 23 in order to properly have antecedent basis for a "fifth" fluid flow line. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

5. Claims 1-15, 17-21, 24, 28, 29, and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Leuchtenberg, or in the alternative under 103(a) as obvious over Leuchtenberg alone.

With respect to claim 17, the reference discloses a system (Figs. 4-6) for centralized distributing, receiving, and treating fluids for a plurality of wells, the system comprising: a centralized well treatment fluid center 18; one or more centralized service factories (collection of equipment surrounding 18); a plurality of distribution lines (1, 14, 22) coupled between the centralized well treatment fluid center and the one or more centralized service factories, wherein the plurality of distribution lines are adapted to flow one or more well development task fluids; and a plurality of return lines (2, 27) coupled between the centralized well treatment fluid center and the one or more centralized service factories, wherein the plurality of return lines are adapted to flow one or more recovered well treatment fluids. With respect to the depending claims, the reference teaches the limitations as claimed. With respect to the associated method claims, the reference teaches the associated methods. Although the reference only shows one well, it is well within the purview of this invention to apply this system over more than one well.

***Allowable Subject Matter***

6. Claims 16, 22, 23, 25-27, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Stoits et al. teaches a system of centralizing well services for a plurality of wells.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to /Zakiya W. Bates/ whose telephone number is (571) 272-7039. The examiner can normally be reached on Monday-Friday, 8:30 AM-5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on (571) 272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zakiya W. Bates/  
Primary Examiner  
Art Unit 3676

Application/Control Number: 11/873,186  
Art Unit: 3676

Page 5

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|                                   |                                       |  |                                                                    |             |
|-----------------------------------|---------------------------------------|--|--------------------------------------------------------------------|-------------|
| <b>Notice of References Cited</b> | Application/Control No.<br>11/873,186 |  | Applicant(s)/Patent Under<br>Reexamination<br>SURJAATMADJA, JIM B. |             |
|                                   | Examiner<br>/Zakiya W. Bates/         |  | Art Unit<br>3676                                                   | Page 1 of 1 |

**U.S. PATENT DOCUMENTS**

| * |   | Document Number<br>Country Code-Number-Kind Code | Date<br>MM-YYYY | Name                    | Classification |
|---|---|--------------------------------------------------|-----------------|-------------------------|----------------|
| * | A | US-7,367,411                                     | 05-2008         | Leuchtenberg, Christian | 175/48         |
| * | B | US-6,236,894                                     | 05-2001         | Stoisits et al.         | 700/28         |
|   | C | US-                                              |                 |                         |                |
|   | D | US-                                              |                 |                         |                |
|   | E | US-                                              |                 |                         |                |
|   | F | US-                                              |                 |                         |                |
|   | G | US-                                              |                 |                         |                |
|   | H | US-                                              |                 |                         |                |
|   | I | US-                                              |                 |                         |                |
|   | J | US-                                              |                 |                         |                |
|   | K | US-                                              |                 |                         |                |
|   | L | US-                                              |                 |                         |                |
|   | M | US-                                              |                 |                         |                |

**FOREIGN PATENT DOCUMENTS**

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**NON-PATENT DOCUMENTS**

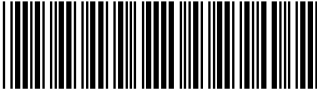
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\*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)  
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

**EAST Search History****EAST Search History (Prior Art)**

| Ref # | Hits | Search Query                                                                                                                                                | DBs                                                     | Default Operator | Plurals | Time Stamp          |
|-------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|------------------|---------|---------------------|
| L1    | 2    | ("6644844").PN.                                                                                                                                             | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2010/01/18<br>11:29 |
| L2    | 5    | (factor\$3 with<br>(wells wellbore\$1<br>borehole\$1) with<br>central\$7) same<br>((distribut\$3 inject<br>\$3) and (receiv\$3<br>return\$3 produc<br>\$4)) | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2010/01/18<br>11:43 |
| L3    | 4    | ((("6991037") or<br>("7391675")).PN.                                                                                                                        | US-PGPUB;<br>USPAT; EPO;<br>JPO;<br>DERWENT;<br>IBM_TDB | OR               | OFF     | 2010/01/18<br>12:21 |

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| <b>Search Notes</b><br> | <b>Application/Control No.</b><br>11/873,186<br><b>Examiner</b><br>/Zakiya W. Bates/ | <b>Applicant(s)/Patent under Reexamination</b><br>SURJAATMADJA, JIM B.<br><b>Art Unit</b><br>3676 |
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| SEARCHED |          |      |          |
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| SEARCH NOTES<br>(INCLUDING SEARCH STRATEGY) |           |      |
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Doc code :IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-08)

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|-----------------------------------------------------------------------------------------------------|------------------------|---------------------|------------|--|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                     | 11873186   |  |
|                                                                                                     | Filing Date            |                     | 2007-10-16 |  |
|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |  |
|                                                                                                     | Art Unit               | 3676                |            |  |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |  |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |  |

| U.S.PATENTS                                                                                                |         |                                      |                           |                        |                                                 |                                                                        |                                                                        |                          |
|------------------------------------------------------------------------------------------------------------|---------|--------------------------------------|---------------------------|------------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------|
| Examiner Initial*                                                                                          | Cite No | Patent Number                        | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
|                                                                                                            | 1       | 6991037                              |                           | 2006-01-31             | Hockinig                                        |                                                                        |                                                                        |                          |
|                                                                                                            | 2       | 7391675                              |                           | 2008-06-24             | Drew                                            |                                                                        |                                                                        |                          |
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| U.S.PATENT APPLICATION PUBLICATIONS                                                                        |         |                                      |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Publication Number                   | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
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| FOREIGN PATENT DOCUMENTS                                                                                   |         |                                      |                           |                        |                                                 |                                                                        |                                                                        |                          |
| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|                                                                                                            | 1       |                                      |                           |                        |                                                 |                                                                        |                                                                        | <input type="checkbox"/> |
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|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

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| Examiner Initials*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Cite No                     | Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published. | T <sup>5</sup>           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1                           | Office Action for U.S. Patent Application No. 11/873,160, dated October 1, 2009                                                                                                                                                                                 | <input type="checkbox"/> |
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| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                                                                                                                                                                                                                                                                 |                          |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | /Zakiya Bates/ (01/18/2010) |                                                                                                                                                                                                                                                                 | Date Considered          |
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| <small> <sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.         </small> |                             |                                                                                                                                                                                                                                                                 |                          |

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|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |  |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |  |

| U.S.PATENTS                                                                                                |         |                                                                                                                                                                                                                                                                 |                           |                        |                                                 |                                                                        |                                                                        |                          |
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| Examiner Initial*                                                                                          | Cite No | Patent Number                                                                                                                                                                                                                                                   | Kind Code <sup>1</sup>    | Issue Date             | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
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| Examiner Initial*                                                                                          | Cite No | Publication Number                                                                                                                                                                                                                                              | Kind Code <sup>1</sup>    | Publication Date       | Name of Patentee or Applicant of cited Document | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear |                                                                        |                          |
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| Examiner Initial*                                                                                          | Cite No | Foreign Document Number <sup>3</sup>                                                                                                                                                                                                                            | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date                                | Name of Patentee or Applicant of cited Document                        | Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
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|                                                                                                     | First Named Inventor   | Jim B. Surjaatmadja |            |
|                                                                                                     | Art Unit               | 3676                |            |
|                                                                                                     | Examiner Name          | Zakiya W. Bates     |            |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1    |            |

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| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | International Preliminary Report on Patentability from PCT/GB2008/001044, dated October 8, 2009 | <input type="checkbox"/> |
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| <b>EXAMINER SIGNATURE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                 |                          |
| Examiner Signature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | /Zakiya Bates/ (01/18/2010)                                                                     | Date Considered          |
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| <small> <sup>1</sup> See Kind Codes of USPTO Patent Documents at <a href="http://www.USPTO.GOV">www.USPTO.GOV</a> or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.         </small> |                                                                                                 |                          |



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| <b>SERIAL NUMBER</b><br>11/873,186                                                                                                                                                                                                                                              | <b>FILING or 371(c) DATE</b><br>10/16/2007<br><b>RULE</b>                                                         | <b>CLASS</b><br>166                                      | <b>GROUP ART UNIT</b><br>3676                                                                                                                                                                                                                                             | <b>ATTORNEY DOCKET NO.</b><br>2006-IP-021186U1 |                           |                                |
| <b>APPLICANTS</b><br>Jim B. Surjaatmadja, Duncan, OK;<br><b>** CONTINUING DATA *****</b><br><b>** FOREIGN APPLICATIONS *****</b><br><b>** IF REQUIRED, FOREIGN FILING LICENSE GRANTED **</b><br>11/02/2007                                                                      |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                |                           |                                |
| Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br>Verified and Acknowledged <u>/ZAKIYA W BATES/</u><br>Examiner's Signature |                                                                                                                   | <input type="checkbox"/> Met after Allowance<br>Initials | <b>STATE OR COUNTRY</b><br>OK                                                                                                                                                                                                                                             | <b>SHEETS DRAWINGS</b><br>7                    | <b>TOTAL CLAIMS</b><br>31 | <b>INDEPENDENT CLAIMS</b><br>2 |
| <b>ADDRESS</b><br>JOHN W. WUSTENBERG<br>P.O. BOX 1431<br>DUNCAN, OK 73536<br>UNITED STATES                                                                                                                                                                                      |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                |                           |                                |
| <b>TITLE</b><br>Method and System for Centralized Well Treatment                                                                                                                                                                                                                |                                                                                                                   |                                                          |                                                                                                                                                                                                                                                                           |                                                |                           |                                |
| <b>FILING FEE RECEIVED</b><br>1710                                                                                                                                                                                                                                              | FEES: Authority has been given in Paper<br>No. _____ to charge/credit DEPOSIT ACCOUNT<br>No. _____ for following: |                                                          | <input type="checkbox"/> All Fees<br><input type="checkbox"/> 1.16 Fees (Filing)<br><input type="checkbox"/> 1.17 Fees (Processing Ext. of time)<br><input type="checkbox"/> 1.18 Fees (Issue)<br><input type="checkbox"/> Other _____<br><input type="checkbox"/> Credit |                                                |                           |                                |

Doc code: IDS

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PTO/SB/08a (07-09)

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|-----------------------------------------------------------------------------------------------------|------------------------|------------------|------------|--|
| <b>INFORMATION DISCLOSURE<br/>STATEMENT BY APPLICANT</b><br>( Not for submission under 37 CFR 1.99) | Application Number     |                  | 11873186   |  |
|                                                                                                     | Filing Date            |                  | 2007-10-16 |  |
|                                                                                                     | First Named Inventor   | Jim Surjaatmadja |            |  |
|                                                                                                     | Art Unit               | 3676             |            |  |
|                                                                                                     | Examiner Name          | Zakiya Bates     |            |  |
|                                                                                                     | Attorney Docket Number | 2006-IP-021186U1 |            |  |

### U.S.PATENTS

| Examiner Initial* | Cite No | Patent Number | Kind Code <sup>1</sup> | Issue Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
|-------------------|---------|---------------|------------------------|------------|-------------------------------------------------|--------------------------------------------------------------------------|
|                   | 1       |               |                        |            |                                                 |                                                                          |

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### U.S.PATENT APPLICATION PUBLICATIONS

| Examiner Initial* | Cite No | Publication Number | Kind Code <sup>1</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
|-------------------|---------|--------------------|------------------------|------------------|-------------------------------------------------|--------------------------------------------------------------------------|
|                   | 1       | 20020125011        | A1                     | 2002-09-12       | Snider et al.                                   |                                                                          |
|                   | 2       | 20060081412        | A1                     | 2006-04-20       | Wright et al.                                   |                                                                          |

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### FOREIGN PATENT DOCUMENTS

| Examiner Initial* | Cite No | Foreign Document Number <sup>3</sup> | Country Code <sup>2</sup> | Kind Code <sup>4</sup> | Publication Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear | T <sup>5</sup>           |
|-------------------|---------|--------------------------------------|---------------------------|------------------------|------------------|-------------------------------------------------|--------------------------------------------------------------------------|--------------------------|
|                   | 1       | WO2008/041010                        |                           | A1                     | 2008-04-10       | Halliburton Energy Services, Inc.               |                                                                          | <input type="checkbox"/> |
|                   | 2       | WO2008/142406                        |                           | A3                     | 2008-11-27       | Halliburton Energy Services, Inc.               |                                                                          | <input type="checkbox"/> |

|                                                                                                     |                      |                  |            |  |
|-----------------------------------------------------------------------------------------------------|----------------------|------------------|------------|--|
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|                                                                                                     | Art Unit             | 3676             |            |  |
|                                                                                                     | Examiner Name        | Zakiya Bates     |            |  |
| Attorney Docket Number                                                                              |                      | 2006-IP-021186U1 |            |  |

|  |   |         |    |   |            |                                    |                          |
|--|---|---------|----|---|------------|------------------------------------|--------------------------|
|  | 3 | 1460647 | GB | A | 1977-01-06 | Intercomp Resource Dev<br>Eng Inc. | <input type="checkbox"/> |
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|-----------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
|                       | 1          | SURJAATMADJA et al., "Consideration for Future Stimulation Options is Vital in Deciding Horizontal Well Drilling and Completion Schemes for Production Optimization," Society of Petroleum Engineers, 2006, SPE 103774                                          | <input type="checkbox"/> |
|                       | 2          | Office Action for U.S. Patent Application No. 11/545,749 dated January 27, 2010                                                                                                                                                                                 | <input type="checkbox"/> |
|                       | 3          | Notice of Allowance and Notice of Allowability for U.S. Patent Application No. 11/753,314 dated December 17, 2009                                                                                                                                               | <input type="checkbox"/> |

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<sup>1</sup> See Kind Codes of USPTO Patent Documents at [www.USPTO.GOV](http://www.USPTO.GOV) or MPEP 901.04. <sup>2</sup> Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>3</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>4</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>5</sup> Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
( Not for submission under 37 CFR 1.99)

|                        |                  |
|------------------------|------------------|
| Application Number     | 11873186         |
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| First Named Inventor   | Jim Surjaatmadja |
| Art Unit               | 3676             |
| Examiner Name          | Zakiya Bates     |
| Attorney Docket Number | 2006-IP-021186U1 |

**CERTIFICATION STATEMENT**

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

**OR**

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

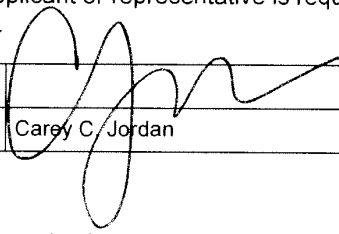
☐ See attached certification statement.

☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ None

**SIGNATURE**

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

|            |                                                                                     |                     |          |
|------------|-------------------------------------------------------------------------------------|---------------------|----------|
| Signature  |  | Date (YYYY-MM-DD)   | 2010-2-9 |
| Name/Print | Carey C. Jordan                                                                     | Registration Number | 47,646   |

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