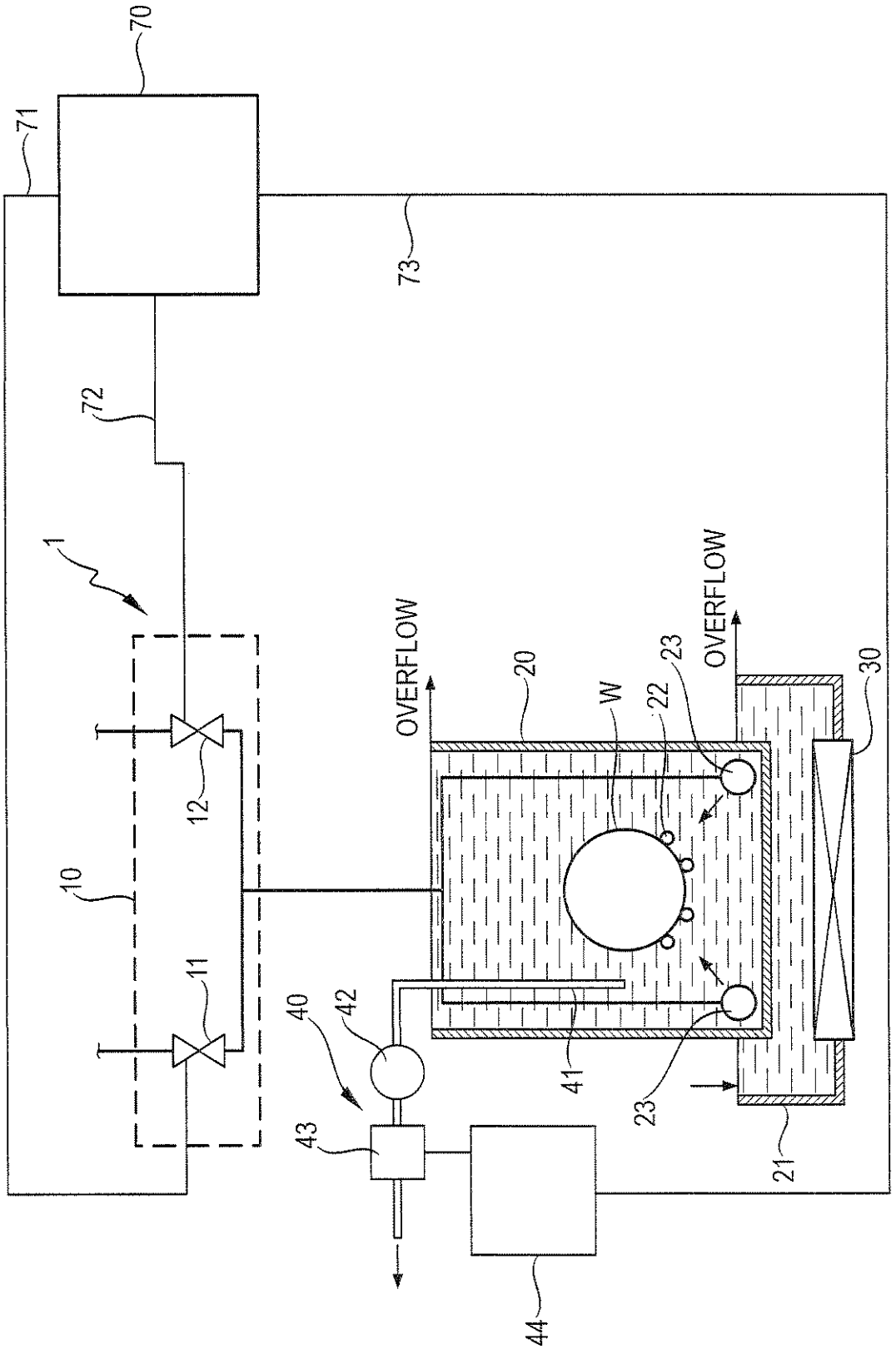

70
71
73
72
1
OVERFLOW
20
W
22
23
OVERFLOW
30
12
10
11
40
42
41
23
43
21
44

Fig. 1

Fig. 2

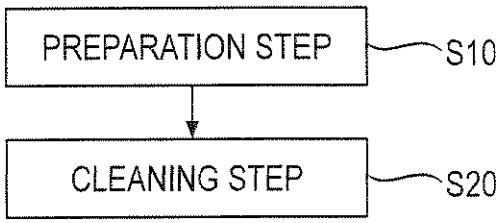

PREPARATION STEP
S10
CLEANING STEP
S20

Fig. 3

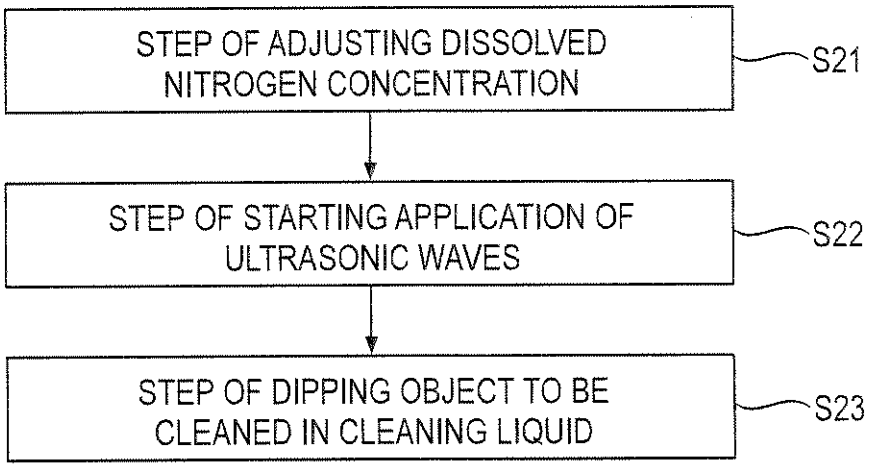

STEP OF ADJUSTING DISSOLVED NITROGEN CONCENTRATION
S21
STEP OF STARTING APPLICATION OF ULTRASONIC WAVES
S22
STEP OF DIPPING OBJECT TO BE CLEANED IN CLEANING LIQUID
S23

Fig. 4

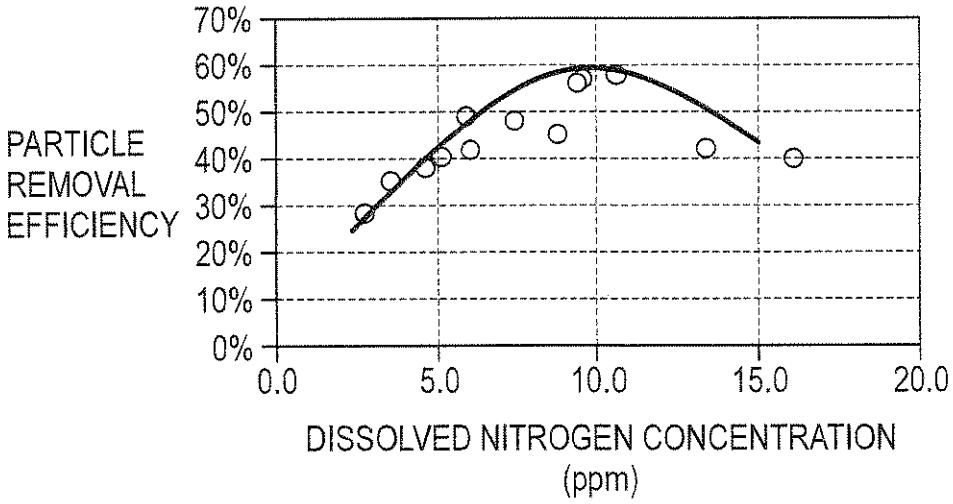

PARTICLE REMOVAL EFFICIENCY
70%
60%
50%
40%
30%
20%
10%
0%
0.0
5.0
10.0
15.0
20.0
DISSOLVED NITROGEN CONCENTRATION (ppm)

Fig. 5

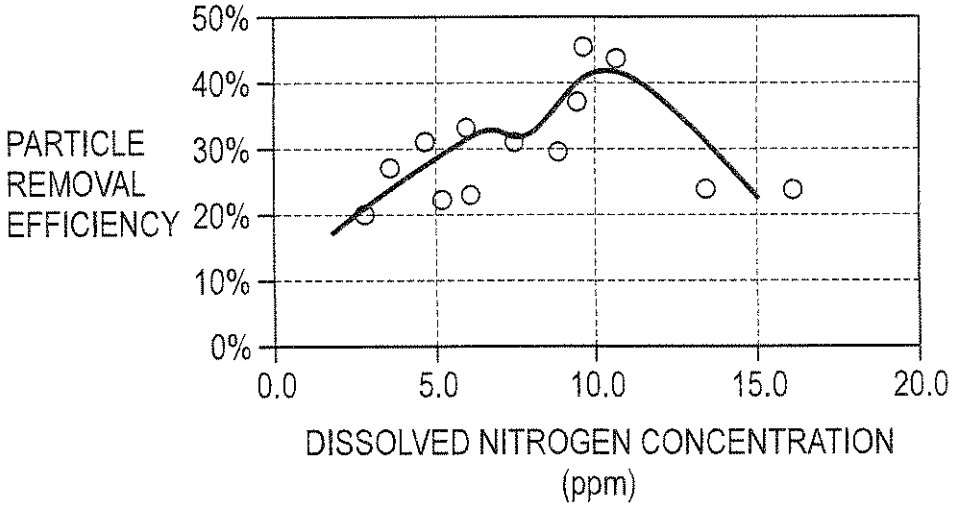

PARTICLE REMOVAL EFFICIENCY
50%
40%
30%
20%
10%
0%
0.0
5.0
10.0
15.0
20.0
DISSOLVED NITROGEN CONCENTRATION (ppm)

Fig. 6

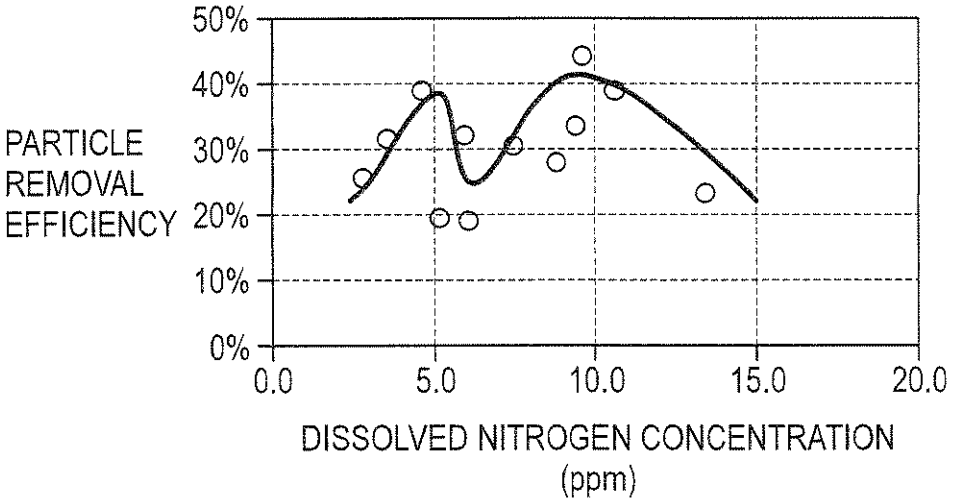

50%
40%
30%
20%
10%
0%
PARTICLE
REMOVAL
EFFICIENCY
0.0
5.0
10.0
15.0
20.0
DISSOLVED NITROGEN CONCENTRATION
(ppm)

Fig. 7

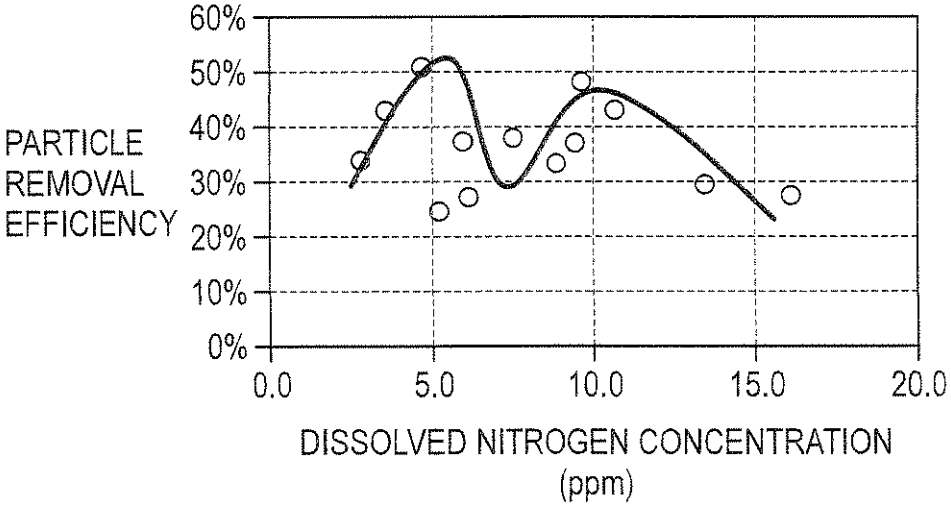
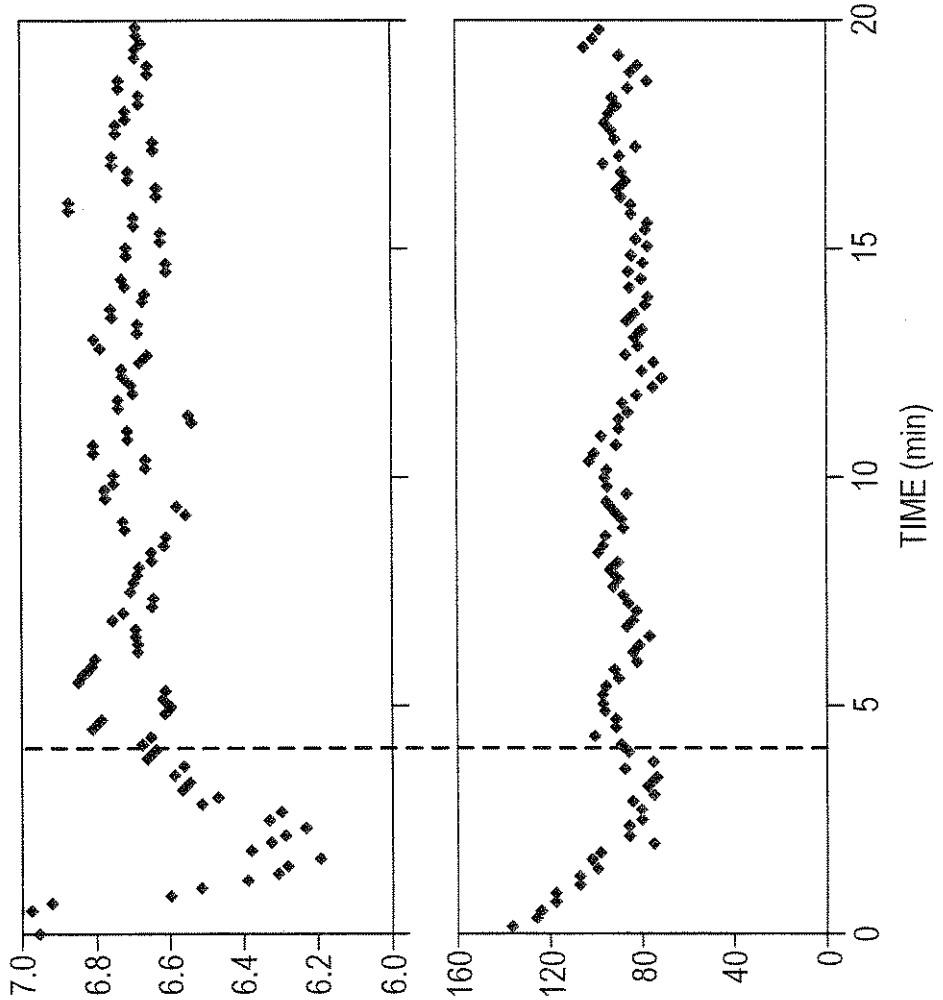

60%
50%
40%
30%
20%
10%
0%
PARTICLE
REMOVAL
EFFICIENCY
0.0
5.0
10.0
15.0
20.0
DISSOLVED NITROGEN CONCENTRATION
(ppm)

Fig. 8


DISSOLVED NITROGEN CONCENTRATION (ppm)
7.0
6.8
6.6
6.4
6.2
6.0
ACOUSTIC PRESSURE (W/in2)
160
120
80
40
0
0
5
10
15
20
TIME (min)