CLAIMS

1. A cleaning equipment for polluted scrubber fluid from an exhaust gas scrubber fluid loop (9), comprising
means for bleeding off part of the polluted scrubber fluid from the scrubber fluid loop (9),
a disc stack centrifugal separator (12, 12') for separating at least a pollutant phase and a cleaned scrubber fluid from said part of the polluted scrubber fluid, which separator comprises a rotor (13, 13') enclosing a separation space (14, 14') with a stack of separating discs (15, 15'), a separator inlet (11, 11') for said part of the polluted scrubber fluid extending into said separating space, a first separator outlet (16, 16') for cleaned scrubber fluid extending from said separating space, and a second separator outlet (17, 17') for the pollutant phase extending from said separating space, which cleaning equipment further comprises
means for conducting said part of the polluted scrubber fluid to the separator inlet, and
means for discharging the cleaned scrubber fluid from the first separator outlet, and
means for collecting the pollutant phase from the second separator outlet.

2. A cleaning equipment according to claim 1 wherein the rotor (13') of the separator further encloses a conveyor screw (18) which is arranged to be driven at a rotational speed differing from the rotational speed of the rotor so that to convey the pollutant phase towards the second separator outlet (17').

3. A cleaning equipment according to claim 2 wherein the separator is arranged to subject said part of the polluted scrubber fluid to a centrifugal force of at least 4000 G, preferably of at least 4500 G, more preferably of

at least 5000 G during a fully developed operational speed in order to separate at least a pollutant phase and a cleaned scrubber fluid from said part of the polluted scrubber fluid.

4. A cleaning equipment according to claim 2 or 3, wherein the separator is controlled to obtain a pollutant phase, wherein the concentration of particles is 20-65 weight percent.

5. A cleaning equipment according to any one of the preceding claims, wherein the separator inlet (11, 11') is of a hermetic type.

6. A cleaning equipment according to any one of the preceding claims, wherein said means for conducting said part of the polluted scrubber fluid to the separator inlet comprises a flow regulating device.

7. A cleaning equipment according to any one of the preceding claims further comprising means (39) for adding a flocculant to said part of the polluted scrubber fluid upstream of the separator inlet (11, 11').

8. A cleaning equipment according to any one of the preceding claims further comprising means for adding a precipitant to said part of the polluted scrubber fluid upstream of the separator inlet (11, 11').

9. A cleaning equipment according to any one of the preceding claims, wherein the scrubber fluid is water, such as tap water, desalinated water, fresh water, etc.

10. A cleaning equipment according to any one of the preceding claims wherein the cleaning equipment comprises means (38) for controlling the quality of the cleaned scrubber fluid, and means for diverting and/or returning the cleaned scrubber fluid to the scrubber fluid loop (9), to the separator inlet (11, 11') or to a tank for polluted scrubber fluid if the quality is below a predetermined level.

11. A cleaning equipment according to any one of the preceding claims wherein the cleaning equipment comprises means for bleeding off parts of the polluted scrubber fluid from more than one scrubber fluid loop and means for conducting said parts of the polluted scrubber fluid to the separator inlet.

12. A cleaning equipment according to claim 11 wherein the means for conducting said parts of the polluted scrubber fluid to the separator inlet comprises flow regulating devices, so that to regulate the flow of the parts of the polluted scrubber fluid from each scrubber fluid loop to the separator inlet.

13. A cleaning equipment according to any one of the preceding claims wherein the means for conducting said part of the polluted scrubber fluid to the separator inlet is arranged to receive polluted phase from a further disc stack centrifugal separator (29), which is arranged to separate at least a pollutant phase and a cleaned scrubber fluid from said polluted scrubber fluid in the scrubber fluid loop.

14. A cleaning equipment according to claim 13, wherein the means for conducting said part of the polluted scrubber fluid to the separator inlet is arranged to receive polluted phase from a further disc stack centrifugal separator (29) via a second buffer tank (37) and a flow regulating device, preferably a pump or valve.

15. A cleaning equipment according to any one of the preceding claims further comprising means for controlling and/or regulating the acidity of said part of the polluted scrubber fluid arranged to keep the pH within the range of 6-8.

16. An exhaust gas cleaning equipment for a diesel engine comprising a gas scrubber having an inlet for exhaust gas, a humidifying device for providing a scrubber fluid to the exhaust gas and a droplet separator for removing polluted scrubber fluid from the exhaust gas and a scrubber fluid loop for circulating the scrubber fluid to the scrubber, connected to a cleaning equipment according to any one of the preceding claims.

17. Use of a disc stack centrifugal separator in a cleaning equipment according to any one of the claims 1-15 to separate at least a pollutant phase and a cleaned scrubber fluid from polluted scrubber fluid being bled off from an exhaust gas scrubber fluid loop.

CLAIMS

1. A cleaning equipment for polluted scrubber fluid from an exhaust gas scrubber fluid loop (9) comprising an exhaust gas scrubber (1) and a first buffer tank (6), the cleaning equipment comprising
means for bleeding off part of the polluted scrubber fluid from the scrubber fluid loop (9),
a disc stack centrifugal separator (12, 12') for separating at least a pollutant phase and a cleaned scrubber fluid from said part of the polluted scrubber fluid, which separator comprises a rotor (13, 13') enclosing a separation space (14, 14') with a stack of separating discs (15, 15'), a separator inlet (11, 11') for said part of the polluted scrubber fluid extending into said separating space, a first separator outlet (16, 16') for cleaned scrubber fluid extending from said separating space, and a second separator outlet (17, 17') for the pollutant phase extending from said separating space, which cleaning equipment further comprises
means for conducting said part of the polluted scrubber fluid to the separator inlet, and
means for discharging the cleaned scrubber fluid from the first separator outlet, and
means for collecting the pollutant phase from the second separator outlet.

2. A cleaning equipment according to claim 1 wherein the rotor (13') of the separator further encloses a conveyor screw (18) which is arranged to be driven at a rotational speed differing from the rotational speed of the rotor so that to convey the pollutant phase towards the second separator outlet (17').

3. A cleaning equipment according to claim 2 wherein the separator is arranged to subject said part of the polluted scrubber fluid to a centrifugal force of at least 4000 G, preferably of at least 4500 G, more preferably of at least 5000 G during a fully developed operational speed in order to separate at least a pollutant phase and a cleaned scrubber fluid from said part of the polluted scrubber fluid.

4. A cleaning equipment according to claim 2 or 3, wherein the separator is controlled to obtain a pollutant phase, wherein the concentration of particles is 20-65 weight percent.

5. A cleaning equipment according to any one of claims 1-3, wherein the separator inlet (11, 11') is of a hermetic type.

6. A cleaning equipment according to any one of claims 1-3, wherein said means for conducting said part of the polluted scrubber fluid to the separator inlet comprises a flow regulating device.

7. A cleaning equipment according to any one of claims 1-3 further comprising means (39) for adding a flocculant to said part of the polluted scrubber fluid upstream of the separator inlet (11, 11').

8. A cleaning equipment according to any one of claims 1-3 further comprising means for adding a precipitant to said part of the polluted scrubber fluid upstream of the separator inlet (11, 11').

9. A cleaning equipment according to any one of claims 1-3, wherein the scrubber fluid is water, such as tap water, desalinated water, fresh water.

10. A cleaning equipment according to any one of claims 1-3, wherein the cleaning equipment comprises means (38) for controlling the quality of the cleaned scrubber fluid adapted to divert and/or return the cleaned scrubber fluid to the scrubber fluid loop (9), to the separator inlet (11, 11') or to a tank for polluted scrubber fluid if the quality is below a predetermined level.

11. A cleaning equipment according to any one of claims 1-3, wherein the cleaning equipment comprises means for bleeding off parts of the polluted scrubber fluid from more than one scrubber fluid loop and means for conducting said parts of the polluted scrubber fluid to the separator inlet.

12. A cleaning equipment according to claim 11 wherein the means for conducting said parts of the polluted scrubber fluid to the separator inlet comprises flow regulating devices, so that to regulate the flow of the parts of the polluted scrubber fluid from each scrubber fluid loop to the separator inlet.

13. A cleaning equipment according to any one of claims 1-3, wherein the means for conducting said part of the polluted scrubber fluid to the separator inlet is arranged to receive polluted phase from a further disc stack centrifugal separator (29), which is arranged to separate at least a pollutant phase and a cleaned scrubber fluid from said polluted scrubber fluid in the scrubber fluid loop.

14. A cleaning equipment according to claim 13, wherein the means for conducting said part of the polluted scrubber fluid to the separator inlet is arranged to receive polluted phase from a further disc stack centrifugal separator (29) via a second buffer tank (37) and a flow regulating device, preferably a pump or valve.

15. A cleaning equipment according to any one of claims 1-3 further comprising means for controlling and/or regulating the acidity of said part of the polluted scrubber fluid arranged to keep the pH within the range of 6-8.

16. An exhaust gas cleaning equipment for a diesel engine comprising a gas scrubber having an inlet for exhaust gas, a humidifying device for providing a scrubber fluid to the exhaust gas and a droplet separator for removing polluted scrubber fluid from the exhaust gas and a scrubber fluid loop for circulating the scrubber fluid to the scrubber, connected to a cleaning equipment according to any one of the preceding claims.

17. Use of a disc stack centrifugal separator in a cleaning equipment according to any one of the claims 1-15 to separate at least a pollutant phase and a cleaned scrubber fluid from polluted scrubber fluid being bled off from an exhaust gas scrubber fluid loop.