System and method for reprocessing bilge water and sludge

The present invention relates to a system and a method for reprocessing bilge water.

Bilge water occurs during operation on ships, but, because of statutory regulations, should not be discharged, unpurified, into the ocean. It is therefore expedient to reprocess or purify the bilge water directly onboard ships to an extent such that it can be discharged directly into the ocean after purification. For this purpose, sediments in the form of a sludge phase and oil residues in the form of an oil phase are separated out of the bilge water and, as a rule, are stored in a common sludge collection tank, together with sludge residues from other processes, for example until the ship reaches port.

Since the capacity of the sludge collection tank is limited, it is expedient to reduce further the quantity of liquid to be stored in the sludge collection tank.

Embodiments of the invention seek to solve this problem.

According to a first aspect of the present invention, there is provided a system for the purification of bilge water, which has at least the following features: a bilge water tank for bilge water, a centrifuge for separating an oil phase and a solid like sludge phase out of the bilge water to be purified, and a sludge collection tank for collecting the separated oil phase and the sludge phase, wherein the sludge collection tank has a recirculation line which ~~issues~~ opens into a line which is arranged between the bilge water tank for bilge water and the

Patent Claims

1. A system for the purification of bilge water, which has at least the following features:
   A) a bilge water tank for bilge water,
   B) a centrifuge for separating an oil phase and a solid-like sludge phase out of the bilge water to be purified, and
   ~~D~~C) a sludge collection tank for collecting the separated oil phase and the sludge phase,
   wherein
   ~~E~~D) the sludge collection tank has a recirculation line which ~~issues~~ opens into a line which is arranged between the bilge water tank for bilge water and the centrifuge.

2. The system as claimed in claim 1, wherein a nonreturn valve is connected into the recirculation line downstream of the sludge collection tank.

3. The system as claimed in claim 1 or 2, wherein a nonreturn valve is connected into the line downstream of the bilge water tank.

4. The system as claimed in claim ~~1, 2 or~~ 3, wherein ~~the~~ a bilge water pump is connected into the line downstream of the nonreturn valve and downstream of the ~~issue~~ opening of the recirculation line into the line.

5. The system as claimed in ~~one of the preceding claims~~claim 4, wherein the power of the bilge water pump is higher than that of ~~the~~ a sludge pump.

6. The system as claimed in ~~one of the preceding~~ claims 4 or 5, wherein the line, into which the recirculation line ~~issues~~opens, is arranged between the bilge water tank for bilge water and the bilge water pump.

7. The system as claimed in one of the preceding claims, wherein the line into which the recirculation line ~~issues~~ opens is a suction line.

8. The system as claimed in one of the preceding claims, wherein the recirculation line is arranged in the bottom and/or on a wall in the lower third of the sludge collection tank.

9. The system as claimed in ~~one of the preceding~~ claims 5 to 8, wherein, during operation, the power of the sludge pump amounts to less than 25%, preferably to less than 15%, of the power of the bilge water pump.

10. The system as claimed in one of the preceding claims, wherein it has a sludge upgrading device.

11. A method for the combined reprocessing of bilge water and sludge by means of a system as claimed in one of the preceding claims, the method comprising the following steps:

a) provision of bilge water in a bilge water tank;

b) transfer of the bilge water from the bilge water tank into a centrifuge;

c) purification of the bilge water, along with the separation of an oil phase and of a sludge phase from a water phase, in a centrifuge, preferably a separator;

d) collection of the sludge phase and of the oil phase in a sludge collection tank; and

e) at least partial recirculation of sludge phase from the sludge collection tank into the centrifuge or into a system element connected upstream of the centrifuge.

12. The method as claimed in claim 11, wherein the oil content of the bilge water before its ~~clarification~~ purification amounts to less than 25% by volume.

13. The method as claimed in claim 11 or 12, wherein, during the transfer of the bilge water according to step b), filtration and/or heating of the bilge water take place/takes place.

14. The method as claimed in one of the preceding claims 11 to 13, wherein recirculation according to step e) is interrupted in so far as emptying of solids from the separator is carried out or when an alarm is triggered. Note: an alarm may be: temperature too high, oscillation limit values of the separator exceeded, etc.

15. The method as claimed in one of the preceding claims 11 to 14, wherein the solid content of the sludge phase discharged from