Claims

1. A ship drive system ~~(1)~~ having at least a first and a second electric drive shaft ~~(11, 12)~~, each of which is provided for driving a propulsion unit ~~(2)~~, in particular a waterjet, wherein each of the electric drive shafts ~~(11, 12)~~ comprises

- at least one speed-variable generator ~~(4)~~ driven by an internal combustion engine ~~(3, 6)~~ for generating a motor voltage having variable amplitude and variable frequency, and
- at least one speed-variable drive motor ~~(5)~~ supplied with said motor voltage and coupled to a propulsion unit ~~(2)~~,

characterized in that the first and the second drive shaft ~~(11, 12)~~ can be switched from a first operating state in which they are electrically decoupled from each other, to a second operating state in which they are electrically coupled to each other in such a way that a transfer of energy can take place from the at least one generator ~~(4)~~ of one drive shaft ~~(11, 12)~~ to the at least one drive motor ~~(5)~~ of the other drive shaft ~~(11, 12)~~.

2. The ship drive system ~~(1)~~ as claimed in claim 1, having a third electric drive shaft ~~(13)~~ for driving a further propulsion unit ~~(2)~~, in particular a waterjet, wherein the third drive shaft ~~(13)~~ comprises

- at least one speed-variable generator ~~(4)~~ driven by an internal combustion engine ~~(6)~~ for generating a motor voltage having variable amplitude and variable frequency, and
- at least one speed-variable drive motor ~~(5)~~ supplied with said motor voltage and coupled to the further propulsion unit ~~(2)~~,

and wherein the first and the third drive shaft ~~(11, 13)~~ can be switched from a first operating state in which they are electrically decoupled from each other, to a second operating state in which they are electrically coupled to each other in such a way that a transfer of energy can take place from the at least one generator ~~(4)~~ of one drive shaft ~~(11, 13)~~ to the at least one drive motor ~~(5)~~ of the other drive shaft ~~(11, 13)~~.

3. The ship drive system ~~(1)~~ as claimed in one of the preceding claims, characterized in that the at least one generator ~~(4)~~ has a superconductor winding, in particular a high-temperature superconductor (HTS) winding.

4. The ship drive system ~~(1)~~ as claimed in one of the preceding claims, characterized in that the at least one drive motor ~~(5)~~ has a superconductor winding, in particular a high-temperature superconductor (HTS) winding.

5. The ship drive system ~~(1)~~ as claimed in claim 4, characterized in that the superconductor winding is a rotating rotor winding.

6. The ship drive system ~~(1)~~ as claimed in one of the preceding claims, characterized in that the drive shafts (11, 13) are coupled by means of an electric line connection ~~(14, 15)~~ which preferably includes a superconductor, in particular a high-temperature superconductor (HTS).

7. The ship drive system ~~(1)~~ as claimed in one of claims 2 to 6,

characterized in that the second and the third drive shaft ~~(12, 13)~~ serve as the main drive for a lower speed range of the vessel and the first drive shaft ~~(11)~~ on its own or in combination with the second and the third drive shaft ~~(12, 13)~~ serves as the main drive for a higher speed range up to the maximum speed of the vessel.

8. The ship drive system ~~(1)~~ as claimed in claim 7, characterized in that the internal combustion engine of the first drive shaft ~~(11)~~ is embodied as a gas turbine ~~(6)~~ and the internal combustion engines of the second and the third drive shaft ~~(11, 12)~~ are embodied as diesel engines ~~(6)~~.

9. The ship drive system ~~(1)~~ as claimed in one of the preceding claims, characterized by an electrical onboard power network converter ~~(22)~~ which is supplied with the motor voltage having variable amplitude and variable frequency of one of the drive shafts ~~(12, 13)~~ and which converts said voltage into a voltage having constant amplitude and constant frequency for an electrical onboard power network.

10. The ship drive system ~~(1)~~ as claimed in one of claims 2 to 8,
characterized by a first electrical onboard power network converter ~~(22)~~ which is supplied with the motor voltage having variable amplitude and variable frequency of the second drive shaft ~~(12)~~ and which converts said voltage into a voltage having constant amplitude and constant frequency for a first electrical onboard power subnetwork ~~(20)~~,
and by a second electrical onboard power network converter ~~(??)~~ which is supplied with the motor voltage having variable amplitude and variable frequency of the third drive shaft ~~(13)~~ and which converts said voltage into a voltage having constant

amplitude and constant frequency for a second electrical onboard power subnetwork ~~(20)~~.

11. The ship drive system ~~(1)~~ as claimed in claim 10, characterized in that the two electrical onboard power subnetworks ~~(20)~~ can be coupled to each other.

12. The ship drive system ~~(1)~~ as claimed in one of claims 9 to 11,
characterized by at least one additional electrical onboard power network generator ~~(25)~~ for supplying the electrical onboard power network or one of the electrical onboard power subnetworks ~~(20)~~ with a voltage having constant amplitude and constant frequency.

13. The ship drive system ~~(1)~~ as claimed in one of claims 9 to 12
characterized in that the at least one generator ~~(4)~~ of the drive shaft ~~(11, 12, 13)~~ can be driven by the internal combustion engine ~~(3, 6)~~ driving it optionally at a fixed or at a variable frequency.

14. The ship drive system ~~(1, 30)~~ as claimed in one of claims 9 to 13, characterized in that the drive shaft ~~(12, 13)~~ can be switched from an operating state in which the at least one generator ~~(4)~~ of the drive shaft ~~(12, 13)~~ is electrically coupled to the at least one drive motor ~~(5)~~ of the drive shaft ~~(12, 13)~~ without the electrical onboard power network converter ~~(22)~~ being interposed therebetween and generates a voltage of variable amplitude and frequency, to an operating state in which the at least one generator ~~(4)~~ of the drive shaft ~~(12, 13)~~ is electrically coupled to the at least one drive motor ~~(5)~~ of the drive shaft ~~(12, 13)~~ by way of the

electrical onboard power network converter ~~(22)~~, the electrical onboard power network converter ~~(22)~~ generating a voltage of variable amplitude and frequency.

15. The ship drive system ~~(1, 30)~~ as claimed in one of claims 9 to 14, characterized in that the drive shaft ~~(12, 13)~~ can be switched from an operating state in which the at least one generator ~~(4)~~ of the drive shaft ~~(12, 13)~~ is electrically coupled to the at least one drive motor ~~(5)~~ of the drive shaft ~~(12, 13)~~ without the electrical onboard power network converter ~~(22)~~ being interposed therebetween and generates a voltage of variable amplitude and frequency, to an operating state in which the electrical onboard power network or electrical onboard power subnetwork ~~(20)~~ is electrically coupled to the at least one drive motor ~~(5)~~ of the drive shaft ~~(12, 13)~~ by way of the electrical onboard power network converter ~~(22)~~, the electrical onboard power network converter ~~(22)~~ generating a voltage of variable amplitude and frequency.

16. An application of the ship drive system ~~(1)~~ as claimed in one of the preceding claims in a multihulled vessel, in particular in a trimaran.