CLAIMS

1. An electric drive system for a motor driven unit comprising an electric motor (10) arranged to rotate a drive shaft (16); a drive planetary gear configuration (70) being in driving engagement with said drive shaft (16) and an output shaft (50) rotatable relative to said drive shaft (16); and means (80, 82) for providing change in rotational speed of said output shaft (50), comprising differential means (20) comprising a first planetary gear configuration (30) being drivingly connected to a first output assembly (52); a second planetary gear configuration (40) being in driving engagement with said first planetary gear configuration (30) via said output shaft (50), said second planetary gear configuration (40) being drivingly connected to a second output assembly (54); said first planetary gear configuration (30) being arranged to co-act with said second planetary gear configuration (40) so as to provide a differential function, **characterized in that** said motor (10) is disposed between said first and second planetary gear configurations (30, 40), wherein said rotational speed changing means (80, 82) are disposed on opposite sides of the motor (10) respectively.

2. An electric drive system according to claim 1, wherein said output shaft (50) is substantially aligned with said drive shaft (16).

3. An electric drive system according to claim 1 or 2, wherein said output shaft (50) is extended through said drive shaft (16).

4. An electric drive system according to any of claim 1-3, wherein said rotational speed changing means (80, 82) are operable between a first state (S1) in which the output shaft (50) rotates with a slower rotational speed than the drive shaft (16), a second freewheeling state (S2), a third state (S3) in which the output shaft (50) and the drive shaft (16) rotate with the same rotational speed, and a fourth fully lockup-state in which drive is prevented.

5. An electric drive system according to any of claim 1-4, wherein said rotational speed changing means (80, 82) comprises a first coupling

assembly (80) operable to engage the ring gear (78) of the drive planetary gear configuration (70).

6. An electric drive system according to ~~any of claim 1-5~~claim 5, wherein said rotational speed changing means (80, 82) comprises a second coupling assembly (82) operable to engage the drive shaft (16) to the output shaft (50), said second coupling assembly (82) being disposed on the opposite side of the motor (10) to the first coupling assembly (80).

7. An electric drive system according to claim 6, wherein said second coupling assembly (82) comprises a shifting arm (82b) configuration.

8. An electric drive system according to claim 6 or 7, wherein said second coupling assembly (82) comprises a piston.

~~9. An electric drive system according to any of claims 1-8, further comprising differential means (20) comprising a first planetary gear configuration (30) being drivingly connected to a first output assembly (52); a second planetary gear configuration (40) being in driving engagement with said first planetary gear configuration (30) via said output shaft (50), said second planetary gear configuration (40) being drivingly connected to a second output assembly (54); said motor (10) being disposed between said first and second planetary gear configurations (30, 40), said first planetary gear configuration (30) being arranged to co-act with said second planetary gear configuration (40) so as to provide a differential function.~~

~~10.~~9. An electric drive system according to ~~claim 9~~any of claims 1-8, wherein said drive planetary gear configuration (70) is disposed between said first and said second planetary gear configurations (30, 40).

~~11.~~10. An electric drive system according to ~~claim 9 or 10~~any of claims 1-9, wherein the ring gears (38, 48) of the first and second planetary gear configurations (30, 40) are engaged via a reversing assembly (22) for said differential function.

~~12.~~11. An electric drive system according to claim ~~11~~10, wherein said reversing assembly (22) comprises a shaft configuration (24) separated from said drive shaft (16).

~~13.~~12. An electric drive system according to claim ~~11~~10 or ~~12~~11, wherein said reversing assembly (22) comprises a rotational direction change configuration, connected to the ring gears (38, 48) of the first and second planetary gear configurations (30, 40) via said shaft configuration.

~~14.~~13. An electric drive system according to any of claims ~~11~~10-~~13~~12, further comprising control means (60; 62; 64; 66) being operable to engage said reversing assembly (22) for controlling said differential means (20).

~~15.~~14. An electric drive system according to claim ~~14~~13, wherein said control means (60; 62; 64; 66) comprises a coupling configuration (62, 64) for braking said reversing assembly (22).

~~16.~~15. An electric drive system according to claim ~~14~~13, wherein said control means comprises a motor (66).

~~17.~~16. A motor driven unit comprising an electric drive system (1) according to any of claims 1-~~16~~15.