and/or electrical supplies, connects to the cleaning machine from the surface for control and power operations, and control of buoyancy reservoirs 90, of the cleaning machine.

[0067] One or more swivel/pivot arrangements 28 can be provided, such as between the drive device one or more of the cleaning pods and/or between cleaning pods. The one or more swivel/pivot arrangements 28 may include a swivel/pivot pin 29 and a swivel/pivot pin receiver 31 . The one or more cleaning pods 16 of the cleaning head 14 can be mounted by the swivel/pivot arrangements. It will be appreciated that the cleaning pods could have the swivel/pivot pin(s) 29 and the swivel/pivot pin receiver(s) 31 can be on supports 30, or vice versa. The supports 30 can connect between the drive device 12 and the cleaning pods.

[0068] Preferably the swivel/pivot axis As for each swivel/pivot arrangement 28 e.g. for each swivel/pivot pin 29 providing swivel/pivot mounting for the respective a cleaning pod 16 are axially aligned.

[0069] A magnet positioning/deployment means 32 can include at least one actuator assembly 34 can be provided on the drive device 12 to position/deploy and retract at least one magnet 36 for use in magnetically adhering the drive device, and therefore the cleaning machine, to the submerged surface.

[0070] The magnet 36 may be mounted for pivoting motion between two adjacent wheels 18. See, by way of example, Figures 6A, 6B, 7A and 7B showing retracted (6A, 6B) and deployed (7A, 7B) positions of the respective magnet 36 using the magnet positioning/deployment means 32 (e.g. including at least one actuator assembly 34).

[0071] The at least one actuator assembly 34 can include at least one actuator 38 (such as an electric drive, pneumatic or hydraulic ram) arranged and configured to actuate a rotational linkage or member 40 to rotate the respective magnet 36 from a stowed position to a deployed position, and the

retract the deployed magnet 36 from the deployed position to the stowed position. In the stowed position, the respective magnet 36 may be attracted to a keeper 42 (such as a steel keeper plate) to help ensure the magnet cannot accidentally deploy.

[0072] The at least one actuator assembly can include coarse and fine magnet positioning. For example, initial rotation of the respective magnet from a stowed position to a deployed position can provide coarse positioning, such that the magnet may be further away from the submerged surface than is ideal for the necessary amount of attraction to the surface (i.e. due to the depth of material and/or density or type of material present on the surface).

[0073] Fine positioning can reduce the gap between the respective magnet and the surface to increase magnetic attraction and help retain the cleaning machine to the submerged surface.

[0074] Fine positioning can be by a cam arrangement 52, such that initial actuation of the actuator rotates the magnet to an initial position, and further actuation moves the magnet closer to the submerged surface.

[0075] The respective actuator can actuate a threaded drive 44, such as a worm drive, engaged with the linkage or member 40 to rotate the linkage or member 40.

[0076] The at least one said magnet 36 may be provided on a pivot member 45 rotationally pivotable and driven by or allowed movement by a pivot link member 46.

[0077] The pivot member 45 can include an arcuate slot 48 within which is received a drive member 50 actuated by the actuator 38. Advancement of the drive member 50 within the arcuate slot 48 causes the linkage or member 40 to rotate and therefore the pivot member 45 and the magnet rotates away from the keeper plate 42 towards a magnet deployed position.

[0078] Further advancement of the drive member 50 within the arcuate slot 48 causes a cam arrangement 52 to move the magnet 36 closer to the submerged surface.

[0079] The gap between the magnet and the submerged surface can be controlled by actuation of the actuator to move the cam arrangement and thereby apply fine distance control/positioning of the magnet relative to the submerged surface.

[0080] The magnet positioning/deployment means may include coarse positioning/deployment and fine positioning/deployment capability - e.g. coarse positioning distance control (D_C, Fig 5B) and fine positioning distance control (D_F, Fig 5C). For example, the magnet deployment means may include rotational deployment and cam actuated fine distance positioning of the respective magnet relative to the submerged surface.

[0081] The cleaning head 14 has at least one cleaning pod 16 including a housing 35 for a cleaning device 56, such as at least one rotatable blade 33a, 33b on a rotatable support, preferably powered by hydraulic flow (such as by a hydraulic hose connected to the respective pod 16) or flow by suction through the housing.

[0082] The respective cleaning pod 16 includes at least part of a pivot or swivel arrangement 60, 62 provided to allow the housing 35 of the cleaning pod to pivot or swivel about a front to rear axis (axis F-R) of the cleaning head or the cleaning machine. The swivel/pivot arrangement for each cleaning pod can allow the pods of a cleaning head to conform generally to the shape of the surface. For example, a marine vessel hull can have compound curves, curving longitudinally to one radius of curvature (which radius can transition) and a different radius of curvature vertically (again, such a radius can transition). The swivel/pivot arrangements provide a gimbal arrangement, preferably on at least one front to rear swivel/pivot axis A_s, allowing the cleaning pods to move relative to one another such that the

overall cleaning head can generally follow the curvature of the surface being cleaned.

[0083] A castor or castors 64 supports the respective cleaning pod 16 by contact with the cleaned portion of the submerged surface i.e. the castor or castors 64 follows a preceding cleaning pod 16 of the cleaning head 14.

[0084] The or each castor 64 can be mounted to the respective cleaning pod 16 by a respective castor swivel/pivot arrangement 65.

[0085] Connection of the cleaning head 14 to the drive device 12 can be at one or more connection points at the front of the drive device 12 and/or by a support arrangement 70 extending between the drive device and the cleaning head. The support arrangement 70 can include at least one support arm or frame 72. It will be appreciated that the support arrangement 70 connects to the drive device 12 between the front and rear wheels thereof, helping to reduce the centre of gravity and help with stabilisation of the entire cleaning machine 10. Leverage effect of the forward weight of the cleaning head 14 is reduced compared to connecting the cleaning head to the drive device in front of the front wheels. Preferably the support arrangement connects to a central portion of the drive device, such as the pump/pump housing 20, 21. The support arrangement can include one more arm, preferably two arms, extending from the pump housing to the cleaning head.

[0086] First physical contact of the cleaning machine with the material to be cleaned/removed from the submerged surface or the submerged surface can be by a cleaning device 33 of the at least one cleaning head 14, such as a cleaning blade 33a, 33b. The or each clean blade may be flexible, partially flexible or rigid. Preferably the or each blade does not contact the surface to be cleaned.

[0087] One or more of the cleaning pods can include a rotary drive 41 for rotational drive to the blade(s) 33. The rotary drive can include hydraulic or

Claims

1. A cleaning machine for cleaning a submerged surface, the cleaning machine comprising: a drive device and at least one cleaning head, the drive device including: a pump, a pump inlet for receiving material cleaned from the submerged surface, a pump outlet for output of the material, traction means for propelling the cleaning machine along the submerged surface, wherein the at least one cleaning head includes multiple cleaning pods disposed forward of the drive device and forward of all traction means for propelling and steering the cleaning machine along the submerged surface in a forward direction of travel of the cleaning machine, and wherein the traction means is configured such that, in use, contact of the traction means with the submerged surface is within a width cleaned by the at least one cleaning head, and wherein the cleaning machine includes magnet positioning/deployment means including at least one actuator assembly providing rotation positioning/deployment and/or retraction of at least one magnet.

2. The cleaning machine of claim 1, wherein the pump is between front traction means and rear traction means.

3. The cleaning machine of claim 1 or claim 2, wherein the pump is an integral structural part of the drive device or is part of a chassis or subchassis of the drive device.

4. The cleaning machine of any one of the preceding claims, wherein the magnet positioning/deployment means includes cam actuated fine distance positioning of the respective magnet relative to the submerged surface.

5. The cleaning machine of claim 1, wherein the magnet positioning/deployment means includes coarse positioning and fine positioning of the at least one magnet relative to the submerged surface.

6. The cleaning machine of any one of claim 1, claim 4 or claim 5, including at least one said magnet positioned towards a rear of the cleaning machine for attraction of the cleaning machine to the surface to be cleaned or being cleaned.

7. The cleaning machine of claim 6, wherein the at least one said magnet is positioned between the front and rear traction means of the cleaning machine.

8. The cleaning machine of claim 6 or claim 7, at least one said magnet positioned between two adjacent traction means of the drive device.

9. The cleaning machine of any one of the preceding claims, wherein at least one of the cleaning pods includes a shroud or skirt with a gap underneath to the submerged surface.

10. The cleaning machine of claim 9, wherein at least one of said cleaning pods include at least a forward or rearward pivot/swivel arrangement, or both a said forward and a said rearward pivot/swivel arrangement, such that the respective cleaning pod is enabled to pivot/swivel about a front to rear axis.

11. The cleaning machine of any one of claims 1 to 10, including at least one castor or other wheel or track directly or indirectly supporting at least one said cleaning pod.

12. The cleaning machine of any one of claims 1 to 10, wherein the at least one cleaning pod includes a body portion including a foam material.

13. The cleaning machine of claim 12, wherein the foam material includes a relatively hard foam material.

14. The cleaning machine of claim 12 or claim 13, wherein the foam material has a wear resistant/polymer coating.

15. The cleaning machine of any one of claims 12 to 14, wherein the body portion is a replaceable or consumable wear part configured to be

changed without the need to replace or remove the cleaning pod from the cleaning machine.

16. The cleaning machine of any one of the preceding claims, wherein at least one support arrangement extends from the drive device to support at least a part of the respective cleaning head.

17. The cleaning machine of claim 16, wherein the support arrangement connects to the drive device between front and rear traction means of the drive device and projects to connect to the cleaning head.

18. A cleaning machine for cleaning a submerged surface, the cleaning machine comprising: a drive device and at least one cleaning head, the drive device including: a pump, a pump inlet for receiving material cleaned from the submerged surface, and a pump outlet for output of the material, and traction means for propelling the cleaning machine along the submerged surface, wherein the at least one cleaning head includes multiple cleaning pods disposed forward of the drive device and forward of all traction means for propelling and steering the cleaning machine along the submerged surface in a forward direction of travel of the cleaning machine, and wherein the traction means is configured such that, in use, contact of the traction means with the submerged surface is within a width cleaned by the at least one cleaning head, and wherein at least one of said cleaning pods includes a housing for a rotatable cleaning device, and wherein the respective cleaning pod includes at least part of a pivot or swivel arrangement provided to allow the housing of the respective cleaning pod to pivot or swivel about a front to rear axis of the cleaning head or the cleaning machine.

19. The cleaning machine of claim 18, further including at least one castor supporting the respective cleaning pod by contact with the cleaned portion of the submerged surface, the at least one castor configured to follow the respective said cleaning pod.

20. The cleaning machine of claim 19, wherein the at least one castor is behind at least one leading said cleaning pod or between a said leading cleaning pod and a trailing said cleaning pod.