New claims

1. (independent) A fish rearing tank comprising the features of:
a) an egg-shaped shell (1) with a generally vertical long axis and gradually narrowing shape towards its tip volume portion (4);
b) said shell (1) forming a generally rigid tank;
c) said shell (1) being closed,
d) said shell (1) having one or more water inlets (11),
e) said shell (2) having one or more water outlets (16, 29),
said egg-shaped tank (1) for holding a water volume in its major lower volume portion and enclosing air in its minor, upper tip volume portion (4).

2. The fish rearing tank of claim 1, comprising
- a ring-shaped buoyancy collar (3, 24) mounted on said egg-shaped shell (1).

semi-submersible:
3. The fish rearing tank of claim 2, said ring-shaped buoyancy collar (3) arranged near said tip portion (4), for holding said egg-shaped shell (1) in a semi-submerged position with said tip portion extending above the sea surface (20).

submersible:
4. The fish rearing tank of claim 2, said ring-shaped buoyancy collar (24) arranged near a widest "equatorial" position of said egg-shaped shell (1), said ring-shaped buoyancy collar (24) further having a ring-shaped water ballast tank (25) for submerging said egg-shaped shell (1) with its tip portion (4) below the sea surface (20).

Ballast:
5. The fish rearing tank of any of the preceding claims, comprising
- a fixed ballast (7) in the broader, lower end of said egg-shaped shell (1).

Central tube:
6. The fish rearing tank of any of the preceding claims, comprising
- an axial oriented central tube (2) extending from the upper tip portion (4) of the egg-shaped shell (1) to the lower, wider end of said egg-shaped shell (1).

Water circulation
7. The fish rearing tank of any of the preceding claims, comprising

- said at least one water inlets (11, 12) arranged in the lower portion of the egg-shaped shell (1).
- said water outlet (16, 29) near below an internal water surface level of the egg-shaped shell (1),

so as for allowing bottom to top or "reverse"-circulation of water through the egg-shaped shell (1) while maintaining said air volume in said tip (4).

Sludge drain:

8. The fish rearing tank of any of the preceding claims, comprising
- a passage (18, 30) near the perimeter (17) of the internal water surface, to a circular holding tank (19, 32) for sludge, non-eaten fodder, fish excrements, and provided with a drain for excess water.

Tangential water inlet

9. The fish rearing tank of claim 7 or 8, wherein said water inlet (11) is horizontal and tangentially directed into the water within said egg-shaped shell (1).

10. The fish rearing tank of claim 7, 8 or 9, wherein
- said water inlets (11) are arranged just above said fixed ballast (7).

Lower water inlet in tube

11. The fish rearing tank of any of claims 7 - 10, comprising
- a lower inlet pump (12) arranged at the lower end of said central tube (2).

12. The fish rearing tank of claim 11, comprising
- at least one water inlet (13, 14, 15) arranged through the side wall of said central tube (2) to within the water volume of said shell (12).

Vertically running grating grid

13. The fish rearing tank of claim 6, comprising
- a vertical axially running folding fish grid (23) comprising a water-permeable central frame (23a) with running wheels for running on said central tube (2), said fish grid having folding wings (23b), preferably with guiding wheels (23g) at their outer ends, said folding wings (23b) arranged for folding in towards said central tube (12) and further arranged for folding out with their outer ends arranged for following the inner surface of said egg-shaped shell (1).

Use of the folding grid

14. The fish rearing tank of claim 13,
- said folding fish grid (23) arranged for being stored in a folded-in position within the air above the internal water surface level, within said upper tip portion (4),
- said folded fish grid (23) arranged for being lowered to a position below the internal water surface in the egg-shaped shell (1);
- said fish grid (23) arranged for being unfolded for the folding wings (23b) to engage with the inner surface of the egg-shaped shell (1);
- said unfolded fish grid (23) arranged for being elevated to force part of all of the fish above said fish grid (23) to move upwardly toward the upper tip portion (4).

15. The fish rearing tank of claim 13 or 14, comprising
- ellipsoid grid bars (23e), (23f) in said fish grid (23) arranged for being rotated between a closed position impenetrable for fish, to a partly or fully open position wherein fish below a given grating size may pass said fish grid (23).

Mooring line

16. The fish rearing tank of any of the preceding claims 6 - 15, comprising
- a vertical mooring line (26) arranged from extending from a hydraulic cylinder or winch (28) within said axial oriented central tube (12) near the upper tip portion (4) and downwardly through the lower end of said central tube (12) to an anchor below the egg-shaped shell (1).

17. The fish rearing tank of any of the preceding claims, comprising
- an air valve (27) arranged above the internal water level in the air volume within said tip (4), so as for letting out air in order to reduce the floatability of the egg when going to submergence.

18. The fish rearing tank of claim 17, wherein
- said air valve (27) is arranged at the upper allowable internal water level within said otherwise air-filled tip (4).

19. The fish rearing tank of claim 18, comprising a ventilation fan in said air-filled tip (4) that also regulates adequate air intake.

20. The fish rearing tank of any of the preceding claims, wherein
- feeding pipes (21) are arranged from above the internal water surface, within the

central tube (12) and having an exit (22) below water from the central tube (12),
- an air driven piston at the top of the feeding pipes, arranged for moving downwardly after the pellet fodder has been fed into the pipe, to push fodder out of the lower opening (22) to provide fish with a batch of fodder.

21. The fish rearing tank of any of the preceding claims, said shell (1) being seamless.

22. The fish rearing tank of any of the preceding claims, wherein said egg-shaped shell (1) generally has a double wall (see Fig. 5D).

23. The fish rearing tank of any of the preceding claims, the volume of said egg-shaped shell (1) being between 4500 m3 and 22000 m3 or more.

24. The fish rearing tank of any of the preceding claims, the diameter of the intake pipe being 2250 mm.

25. The fish rearing tank of any of the preceding claims, the water discharge module (16, 29) directed with an outlet direction along with the water rotation generated by the inlet direction of the tangential water inlets (11).

26. A method of rearing fish, comprising the steps of:
- providing a fish rearing tank comprising the features of:
a) an egg-shaped shell (1) with a generally vertical long axis and gradually narrowing shape towards its tip volume portion (4);
b) said shell (1) forming a generally rigid tank;
c) said shell (1) being closed,
d) said shell (1) having one or more water inlets (11),
e) said shell (2) having one or more water outlets (16, 29),
said egg-shaped tank (1) for holding a water volume in its major lower volume portion and enclosing air in its minor, upper tip volume portion (4);
- placing a number of fish in said egg-shaped shell (1);
- circulating in fresh seawater through said water inlets (11, 12) arranged in the lower portion of the egg-shaped shell (1); and
- circulating out used water through said water outlet (16, 29) near below an internal water surface level of the egg-shaped shell (1),
so as for conducting bottom to top circulation of water through the egg-shaped shell (1) while maintaining its air-filled volume in said tip (4).

27. The method of claim 26, opening an air valve (27) to let out part of the air contained in said tip (4), and allowing the tip (4) to submerge to a desired depth below the sea surface, while conducting the circulation of water through the shell (1).

28. The method of claim 26 or 27, controlling the water content in a ballast tank (25) about said shell (1), and allowing the tip (4) to submerge to a desired depth below the sea surface, while conducting the circulation of water through the shell (1).

29. The method of claim 26, 27, or 28, tightening a mooring line (26)), and allowing the tip (4) to submerge to a desired depth below the sea surface, while conducting the circulation of water through the shell (1).

30. The method of any of the preceding claims, for moving all or part of the fish within the shell (1),
- providing a vertical axially running, folding fish grid (23) comprising a water-permeable central grating frame (23a) with running wheels for running on said central tube (2), said fish grid having folding wings (23b), preferably with guiding wheels (23g) at their outer ends, said folding wings (23b) arranged for folding in towards said central tube (12) and further arranged for folding out with their outer ends arranged for following the inner surface of said egg-shaped shell (1);
- running said folded grating frame (23a) to the lower end of said egg-shaped shell (1);
- unfolding said grating frame (23a) for said folding wings (23b) to reside with their outer ends near or at said inner surface of said egg-shaped shell (1);
- adjusting the grating so as for enabling sorting or moving a part or all of the contained fish population;
- running said grating frame (23a) upwardly while said folding wings follow said inner surface of said egg-shaped shell (1) thereby sorting or moving said part of the contained fish.

31. The method of claim 30, folding in said folding wings (23b) and running said central grating frame (23a) to above the water surface for internal storage while not in use for grating.

32. The method of any of the preceding claims, pumping in water tangentially through said water inlets (11) near the lower end of said shell (1) so as for generating a rotational and upward water movement through said shell (1) to said water discharge

modules (16, 29) near below the internal water surface.

33. The method of claim 32, allowing said rotational and upward water movement about said central axial tube (2).

34. The method of claim 33, due to the rotational rising water movement, allowing particles to concentrate at the internal water surface towards the perimeter of the tank (17), and letting out said surface particles to move out over the passage (30) to said sludge holding tank (32).

35. The method of any of the preceding claims, loading feed into one or more feeding pipes (21) mounted inside the centre tube (2) and extending between 3 meters above water level and end approximately 5 and 10 meters above the bottom of the tank at which point they exit the tube into the tank (22), driving an air driven piston downwardly after the filling with desired volume of feed into the pipe, pushing the feed downwards and out of the lower opening (22) of the pipe providing fish with batches of feed.