CLAIMS

1. A drilling mud treatment unit ~~(100)~~ comprising:

- a primary duct ~~(10)~~ for feeding previously coagulated drilling mud;

- an in-line flocculation system ~~(20)~~ for flocculating the previously coagulated drilling mud flowing in the primary duct ~~(10)~~; and

- at least one hydrocyclone ~~(30)~~ fed by the primary duct ~~(10)~~ and arranged downstream from the flocculation system ~~(20)~~, the hydrocyclone ~~(30)~~ having an overflow orifice ~~(32)~~ for receiving a liquid product resulting from treatment of the drilling mud and an underflow orifice ~~(34)~~ for receiving a solid product resulting from treatment of the drilling mud, the overflow orifice ~~(32)~~ presenting an overflow diameter ~~(Do)~~ and the underflow orifice presenting an underflow diameter ~~(Du)~~, and the underflow diameter ~~(Du)~~ being greater than the overflow diameter ~~(Do)~~, with a ratio greater than 1.1 between the underflow diameter ~~(Du)~~ and the overflow diameter ~~(Do)~~.

2. A treatment unit ~~(100)~~ according to claim 1, wherein the primary feed duct ~~(10)~~ is provided with a pump ~~(12)~~, and the in-line flocculation system ~~(20)~~ includes a secondary duct ~~(22)~~ for feeding flocculating agent, said secondary duct ~~(22)~~ being connected to the primary duct ~~(10)~~ at a junction ~~(J)~~ situated downstream from the pump ~~(12)~~.

3. A treatment unit ~~(100)~~ according to claim 2, wherein the in-line flocculation system ~~(20)~~ comprises in-line mixer means ~~(24)~~ for mixing the coagulated drilling mud and the flocculating agent, said means being provided in the primary duct ~~(10)~~ downstream from the junction ~~(J)~~.

4. A treatment unit ~~(100)~~ according to claim 3, wherein the mixer means ~~(24)~~ comprise a static mixer.

5. A treatment unit ~~(100)~~ according to claim 3 or claim 4, wherein the mixer means ~~(24)~~ are arranged at a distance from the hydrocyclone ~~(30)~~ in the primary duct ~~(10)~~ that is shorter than 5 m, preferably shorter than 2 m.

6. A treatment method for treating drilling mud, the method comprising at least the following succession of steps:

- feeding a primary feed duct ~~(10)~~ with coagulated drilling mud;
- flocculating said coagulated drilling mud in-line while it is flowing in said primary duct ~~(10)~~;
- introducing the coagulated and flocculated drilling mud into a hydrocyclone ~~(30)~~ having an overflow orifice ~~(32)~~ presenting an overflow diameter ~~(Do)~~, and an underflow orifice ~~(34)~~ presenting an underflow diameter ~~(Du)~~, the underflow diameter ~~(Du)~~ being greater than the overflow diameter ~~(Do)~~, with a ratio greater than 1.1 between the underflow diameter ~~(Du)~~ and the overflow diameter ~~(Do)~~; and
- discharging a solid product resulting from treatment of the drilling mud via the underflow orifice ~~(34)~~, and a liquid product resulting from treatment of the drilling mud via an overflow orifice ~~(32)~~.

7. A treatment method according to claim 6, wherein said drilling mud includes a stabilizing agent such as, for example, smectic clay or a hydrosoluble organic polymer.

8. A treatment method according to claim 6 or claim 7, wherein the solid product of treating the drilling mud presents dryness greater than 30%.

9. A treatment method according to any one of claims 6 to 8, wherein the liquid product of treating the drilling

mud is water containing less than 600 milligrams per liter of matter in suspension.

10. A treatment method according to any one of claims 6 to 9, wherein the primary duct ~~(10)~~ is fed with previously coagulated drilling mud under turbulent conditions.