

**Internal distribution code:**

- (A) [ - ] Publication in OJ
- (B) [ - ] To Chairmen and Members
- (C) [ - ] To Chairmen
- (D) [ X ] No distribution

**Datasheet for the decision  
of 5 September 2025**

**Case Number:** T 0661/24 - 3.2.01

**Application Number:** 16838073.1

**Publication Number:** 3400165

**IPC:** B63B39/06

**Language of the proceedings:** EN

**Title of invention:**

METHOD FOR ATTENUATING THE OSCILLATION OF A SHIP

**Patent Proprietor:**

P.S.C. Engineering

**Opponent:**

CMC Marine S.r.l.

**Headword:**

**Relevant legal provisions:**

EPC Art. 100(b), 80

**Keyword:**

Grounds for opposition - insufficiency of disclosure (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**

**Boards of Appeal**

**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0

Case Number: T 0661/24 - 3.2.01

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.01**  
**of 5 September 2025**

**Appellant:** CMC Marine S.r.l.  
(Opponent) Via Francia, 16  
56021 Cascina (PI) (IT)

**Representative:** Buzzi, Notaro & Antonielli d'Oulx S.p.A.  
Corso Vittorio Emanuele II, 6  
10123 Torino (IT)

**Respondent:** P.S.C. Engineering  
(Patent Proprietor) Via Masera 6  
10146 Torino (IT)

**Representative:** Garavelli, Paolo  
A.BRE.MAR. S.R.L.  
Consulenza in Proprietà Industriale  
Via Servais 27  
10146 Torino (IT)

**Decision under appeal:** **Decision of the Opposition Division of the  
European Patent Office posted on 11 March 2024  
rejecting the opposition filed against European  
patent No. 3400165 pursuant to Article 101(2)  
EPC.**

**Composition of the Board:**

**Chairman** G. Pricolo  
**Members:** S. Mangin  
A. Jimenez

## **Summary of Facts and Submissions**

- I. The appeal was filed by the appellant (opponent) against the decision of the opposition division to reject the opposition filed against the patent in suit (hereinafter "the patent").
- II. The opposition division held that the patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.
- III. Oral proceedings were held before the Board on 5 September 2025.
- IV. **The appellant (opponent)** requested that the decision under appeal be set aside and that the patent be revoked.

**The respondent (patent proprietor)** requested that the appeal be dismissed.

- V. Claim 1 of the patent as granted reads as follows:

Method for attenuating the oscillation of a ship (1), said ship (1) comprising a controller (10) of a drive (20) adapted to rotate at least one fin (30), between a first angular position (A1min) and a second angular position (A1max, A2max), in both clockwise and anticlockwise directions, to allow stabilizing the ship (1), when the ship (1) is anchored, at zero speed, wherein the motion of said at least one fin (30) comprises an initial acceleration step, an intermediate step at constant speed and a final deceleration step, **characterized in that,**

in the initial acceleration step, said first angular position (A1min) corresponds to an inclination of  $-30^\circ$  of said at least one fin (30), with respect to a main axis of the ship (1), wherein said second angular position (A1max) corresponds to an inclination of  $+90^\circ$  of said at least one fin (30), with respect to a main axis of the ship (1) cancelling the roll moment developed by said at least one fin (30) in the final deceleration step, or wherein said second angular position (A2max) corresponds to an inclination lower than  $+150^\circ$  of said at least one fin (30), with respect to the main axis of the ship (1) compensating at least the oscillation moment of the intermediate step, included in an angular inclination between  $90^\circ$  and  $150^\circ$ , at constant speed, with respect to said rotation axis (31) of said at least one fin (30).

- VI. Reference is made to E2 : *"Fuzzy Control of Fin Stabilizer at Zero Speed Based on Improved Genetic Algorithm"*, Hongzhang Jin and Al.

## **Reasons for the Decision**

### 1. Sufficiency of disclosure

The patent does not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

- 1.1 The appellant (opponent) argued that the invention was not sufficiently disclosed.

- 1.1.1 The appellant noted that for the stabilization at zero speed, it was well-known that a traditional fin stabilizer developed a force proportional to the cosine

of the inclination of the fin (reference was made to E2):

$$K_c = (k_1 \omega^2 + k_2 \dot{\omega}) \cos \alpha \quad (2)$$

Thus, the opposed patent did not invent that the roll moment was zero at +/- 90° or inverted, e.g., when the fin angle is between 90° and 180°. This was rather a physical effect inherent to the above equation.

- 1.1.2 Furthermore, figure 8 of the patent only showed a rotation from -30° to +150° and figure 9 of the patent from 150° to -30°. However, the second alternative of claim 1 used the wording "lower than 150°" which included also fin angles of e.g. 100°, was clearly not disclosed in the opposed patent. In the context of a 360° rotation, the angle of -30° was only disclosed in combination with an angle of 150°, i.e., rotations of 180°.
  
- 1.2 The respondent (patent proprietor) argued that the patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.
  - 1.2.1 The respondent explained that the patent disclosed how to cancel or at least partially cancel the negative effect of the fin's deceleration that takes place for example when a "bang bang" movement of the fins is used to attenuate the rolling of the ship.

Referring to figures 3 to 6, the respondent (patent proprietor) explained that in the prior art using the "bang bang" movement of the fin rotating between -30° to +30° for attenuating the rolling of a ship, the deceleration phase (C) was cancelling the effect of the acceleration (A), such that only the constant velocity

of the fin between the acceleration and the deceleration had an impact on the attenuation of the rolling of the ship.

Based on this observation and in view of the force of the fin being proportional to the cosine of the fin angle, the patent proposed that the fin starting from an inclination of  $-30^\circ$  (Almin) either stopped at an inclination of  $+90^\circ$  (A1max: first alternative) or stopped at an inclination lower than  $+150^\circ$  (A2max: second alternative). This enabled in the first alternative to minimise the impact of the fin's deceleration as the cosine around  $90^\circ$  was close to null and in the second configuration to have the fin's deceleration contribute to the attenuation of the roll as the cosine of an angle between  $90^\circ$  and  $150^\circ$  was negative. The fin roll torque of the first alternative was shown in figure 11 and the fin roll torque of the second alternative was shown in figure 12 of the patent.

- 1.2.2 The respondent (patent proprietor) underlined that after the first initial step, the intermediate step at constant speed and the final deceleration step, the skilled person could choose the correct fin stroke depending on the situation. The skilled person knew, from the present patent, the force of the fin in all  $360^\circ$  rotation and could synchronize the fin movement with the roll motion in the correct manner. The fin could rotate in clockwise and counter-clockwise direction.

For the first alternative, the fin was not forced to go back from  $90^\circ$  to  $-30^\circ$  counter-clockwise, as in the previous art, but it could continue the rotation in a clockwise direction. It was possible to synchronize the

fin deceleration with the roll motion and take the advantages of the present patent.

The skilled person knew, from common control knowledge, that the damp of the roll motion was obtained if the fin roll torque was opposite to the roll motion. So the skilled person could take advantage, with respect to the known art, also through the fin stroke from  $+90^\circ$  to  $-30^\circ$  counter-clockwise with a correct synchronization to the roll motion.

For the second alternative, the respondent (patent proprietor) argued that during the fin stroke from  $-30^\circ$  to  $150^\circ$  the fin developed mainly a positive ship roll torque. To damp the roll motion, in the following half roll period it was necessary to develop a negative roll moment: the roll torque must change sign for each half roll period otherwise the fin roll torque amplified the roll motion instead of damping it.

After the initial movement from  $-30^\circ$  to  $+150^\circ$ , the fin could rotate counter clockwise from  $+150^\circ$  to  $-30^\circ$  in synchronisation with the roll motion.

The patent (paragraphs [0032], [0033], [0040]) also taught in figures 8 and 9 to rotate the fin in the same direction as the first movement to damp the roll motion during the following half-period or roll motion.

With the knowledge of the cosine function, the skilled person in the art could translate all characteristics of the fin stroke from  $-30^\circ$  to  $+150^\circ$ , clockwise, to the fin stroke from  $+150^\circ$  to  $-30^\circ$  clockwise (reference was made to figure 3 of the patent). The second half rotation had the same properties as the previous half rotation but with opposite ship roll moment. This fin stroke kept the inversion of the roll moment when the deceleration happened after it crossed  $-90^\circ$  provoking

the transformation of the fin deceleration effect with the same sign of the fin acceleration phase.

1.2.3 The respondent (proprietor) also explained that if the initial fin rotation was from  $-30^\circ$  to an angle of  $+120^\circ$ ,  $+130^\circ$  or  $+140^\circ$  (i.e covering less than  $180^\circ$ ), the skilled person could appropriately choose the following movement of the fin to damp the rolling movement in view of the roll. The fin could further rotate in clockwise direction or anticlockwise direction. The following rotation depended on the roll motion. This was a matter of control which the skilled person was familiar with. The patent did not have to disclose all possible ways to reduce the invention into practice. The patent explained the law of motion of the fin, which enabled the skilled person with common general knowledge to control the fin depending on the roll motion.

1.3 The Board judges that the patent does not enable the skilled person to carry out the invention over the whole scope of the claims.

1.3.1 According to the established case law the requirement of sufficiency of disclosure defined in Article 83 EPC is only complied with if the disclosure of the invention allows the skilled person to perform, without undue burden, essentially all the embodiments covered by the claimed invention.

Furthermore, it is settled case law that a technical effect is to be taken into account in assessing enablement if it is explicitly claimed.

1.3.2 Claim 1 defines a method of attenuating the oscillation of a ship, which allows the stabilisation of the ship

when the ship is anchored, at zero speed. The effect of the method of claim 1 being claimed, the skilled person when reworking the invention should be able to stabilise the ship or at least attenuate its oscillation movements.

While the patent gives information about the method of attenuating the oscillation of the ship when the initial fin movement is from an inclination of  $-30^\circ$  to  $+90^\circ$  and from an angular position of  $-30^\circ$  to  $+150^\circ$ , the patent does not give any information when the initial fin movement is from  $-30^\circ$  to  $+120^\circ$ ,  $+130^\circ$  or  $+140^\circ$  although it is covered by the second alternative of claim 1 which reads "wherein said second angular position (A2max) corresponds to an inclination lower than  $+150^\circ$ ".

For the initial fin rotation from  $-30^\circ$  to  $+120^\circ$ ,  $+130^\circ$  or  $+140^\circ$  the force of the fin can be deduced from figure 12. However, no information is given in the patent as to the next rotation steps to be carried out to attenuate the oscillation of the ship. The Board understands that it will depend on the roll motion, however the skilled person is not given any information on how to synchronise the roll motion and the movement of the fin when the initial fin rotation covers an angle of less than  $180^\circ$ . The direction of the next rotation steps and the angles spanned are not disclosed. Without this information the skilled person is unable to rework the invention to stabilise the ship without undue burden when the first movement spans an angle from  $-30^\circ$  to less than  $+150^\circ$ .

The skilled person is familiar with bang-bang fin movements, wherein the fin is moving fast from one extreme position to the other around a  $0^\circ$  angle

position in a quarter of ship roll period. However for an initial rotation of from  $-30^{\circ}$  to  $+120^{\circ}$ ,  $+130^{\circ}$  or  $+140^{\circ}$  there is no information what the next fin rotation should be and how it should be synchronised with the roll motion. The prior art synchronisation in the case of the bang-bang movement is different and cannot be applied, such that information would be required in the patent for the skilled person to carry out the invention.

The force of the fin can be predicted over  $360^{\circ}$ . However, this information is not enough to enable the skilled person to carry out the invention over the whole scope of claim 1.

## Order

### For these reasons it is decided that:

The decision under appeal is set aside.

The patent is revoked.

The Registrar:

The Chairman:



A. Wille

G. Pricolo

Decision electronically authenticated