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D E C I S I O N
of 5 March 2002

Case Number: T 0498/00 - 3.2.1

Application Number: 92850013.1

Publication Number: 0497748

IPC: B63B 1/12

Language of the proceedings: EN

Title of invention:

A hull structure for multi-hull ships

Patentee:

STENA REDERI AKTIEBOLAG

Opponent:

AUSTAL SHIPS Pty ltd.

Headword:

-

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0498/00 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 5 March 2002

Appellant: AUSTAL SHIPS Pty ltd.
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Respondent: STENA REDERI AKTIEBOLAG
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 19 April
2000 concerning maintenance of European patent
No. 0 497 748 in amended form.

Composition of the Board:

Chairman: F. A. Gumbel
Members: S. Crane
G. E. Weiss

Summary of Facts and Submissions

- I. European patent No. 0 497 748 was granted on 21 September 1994 on the basis of European patent application No.92 850 013.1.
- II The granted patent was opposed by the legal predecessor to the present appellants. They requested revocation of the patent in its entirety on the grounds that its subject-matter lacked novelty and/or inventive step (Article 100(a) EPC).

As evidence of the state of the art they relied in the notice of opposition *inter alia* on documents concerning the prior use of a catamaran built by the present appellants in 1990. The vessel was named "Shun Shui". These documents were labelled "D2". Also relied upon was an article concerning the catamaran "Patria" in "Shipping World & Shipbuilder", 1989, pages 304 to 307 (document D3). Subsequently there was also submitted a report drawn up by Mr James Black of the present appellants concerning various vessels and their hull forms including the "Shun Shui" the hull of which was designated "Austal 18" by the shipbuilders. This report, dated 6 March 1996, was labelled "document D5".

With letters dated 22 June, 25 June and 23 July 1998 extensive observations were made by a third party under Article 115 EPC. The bulk of the documents submitted comprised affidavits filed in opposition proceedings against the corresponding Australian patent application.

With a letter dated 16 April 1999 the legal predecessor of the present appellants filed, in support of their

submissions, a set of papers deriving from the third party observations and evidence filed by the present respondents (proprietors of the patent). This set of papers was labelled "document D7". For convenience this designation will be maintained in the present decision.

III. With its decision posted on 19 April 2000 the Opposition Division held that the patent could be maintained in amended form. Claim 1 on which that decision was based reads as follows:

"A hull for multi-hull seagoing passenger and cargo vessels capable of speeds greater than 30 knots, wherein the vertical distance from the hull base line to the volumetric centre-of-gravity of the underwater body of the hull up to a water line that corresponds to a normally occurring hull draft is greater than 55% of the draft of the hull defined between the base line and the water line in the case of the sternwards half of the hull located between the stern and midships of the hull, and the width of the hull at the water line is substantially greater in the afterbody of the hull than in the forward body of the said hull and generally decreases in a forward direction, and the cross-sectional shape of the hull at the forward half of the hull includes a bulbous underwater and narrow waisted part which extends through the water line **characterized in** that said vertical distance is less than 55% of the draft of the forward half of the hull located between the forebody of the hull and midships; and in that the distance between the base line and the gravity centre point of the frame area delimited by the water line at a position corresponding to 75% of the total length of the underwater body of the hull calculated from the stern of the hull is less than 55% of the draft."

- IV. A notice of appeal against this decision was filed on 19 June 2000, the fee for appeal having been paid four days earlier.

The statement of grounds of appeal was filed on 25 August 2000. With this statement were filed four new documents "A" to "D", relating to the hull form of the vessel "Shun Shui".

With further submissions of 5 February 2002 the appellants filed additional documents emanating from the Australian opposition proceedings, including an extensive expert report by Mr Nigel Watson on comparisons between the performance of various hull shapes among them "Austal 18", "Austal 18" modified to fall within the terms of the contested patent, and the preferred embodiment of the contested patent.

- V. Oral proceedings before the Board were held on 5 March 2002.

The appellants requested that the decision under appeal be set aside and the patent revoked in its entirety.

The respondents requested that the appeal be dismissed and the decision of the Opposition Division confirmed.

At the oral proceedings the respondents presented written comments on the further submissions of the appellants from 5 February 2002.

- VI. The arguments of the appellants in support of their request for revocation of the patent were substantially as follows:

Although not as such unclear, various terms used in present claim 1 were very broad in ambit. In particular the statement that the width of the hull at the waterline "generally decreases in a forward direction" did not exclude short sections of the hull where the width was constant or even increasing. As for the requirement of a particular waisted cross-sectional shape of the hull "at the forward half", this could not be understood as meaning that all of the forward half of the hull, or even the majority of it had this shape. The term merely required that the stated cross-sectional shape was present somewhere in the forward half. Taking the wide scope of these terms into account there could be no dispute that the "Austal 18" hull corresponded to what was defined in the preamble of claim 1.

The characterising clause of the claim required that two specified vertical distances should be less than 55% of the normally occurring hull draft. The evidence showed that in the case of the "Austal 18" hull the corresponding values were slightly less than 57%. The differences between what was claimed and the prior art was so small as to be negligible and covered by normal tolerances and/or differences in loading and trim of the associated vessel. As could be clearly seen in particular from Mr Watson's report differences of this magnitude had no appreciable effect on sea-keeping. As a consequence the subject-matter of the claim lacked novelty.

However, even if novelty were conceded, it was apparent that the marginal differences involved could not justify an inventive step. In comparison with the "Austal 18" hull at the claimed invention proposed was

to apply to a somewhat greater extent principles deriving from the known "small water area twin hull" (SWATH) concept. The arguments and evidence presented by the respondents in support of their invention leading to a dramatic improvement in sea-keeping were all related to vessels whose parameters were far removed from the limits set by the claim.

VIII. The respondents argued essentially the following in reply:

The special cross-sectional shape of the forward half of the hull as defined in the preamble of claim 1 did not indeed need to extend along the whole length of the forward half but at least along a major portion of it extending sternwards from the prow of the vessel. This interpretation was consistent with and supported by the second requirement stated in the characterising clause of the claim concerning the position of the gravity centre point of the frame area at a position 75% along the hull considered from stern to prow. The "Austal 18" hull had nothing more than a conventional bulbous bow and did not exhibit the special cross-sectional shape defined in the preamble of the claim along any significant length of the hull. This feature had therefore been mistakenly placed in the preamble of the claim and was in fact an important distinction over the prior art.

In addition to this the "Austal 18" hull did not meet either of the requirements specified in the characterising clause of the claim. The differences between the values actually measured with respect to the "Austal 18" hull and those specified in the claim were not insignificant and the arguments of the

appellants that they would be covered by normal tolerances or be negated by changes in loading or trim of the vessel were not supported by the facts. The subject-matter of claim 1 was therefore clearly novel.

The tests performed by the appellants in an attempt to demonstrate that there was no appreciable improvement in performance between the hull claimed and the "Austal 18" hull were invalid since the tested hull allegedly conforming to the invention did not have the required cross-sectional shape of hull over a major portion of the forward half. The fact of the matter was that the invention represented a breakthrough in hull design for high speed multi-hull vessels, enabling the pitching centre to be brought significantly forwards of midships with a dramatic improvement in sea-keeping qualities.

Reasons for the Decision

1. The appeal is complies with the formal requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC. It is therefore admissible.

2. As explained in the introductory description of the patent specification the several well-known advantages of multi-hull vessels of the catamaran type are associated with one troublesome drawback, which is their susceptibility to violent vertical acceleration in heavier seas. A design concept developed to combat this was the "small water area twin hull"(SWATH) vessel which had completely submerged torpedo like hulls on which the superstructure was supported via narrow struts extending through the water line (an example of

such a vessel is the "Patria" described in documents D3). Although the sea-keeping properties of a SWATH vessel were excellent, the design was beset with various problems, in particular low load stability and difficulty in the installation of the power system.

Against this background the object of the claimed invention is thus (cf. column 2, first paragraph of the patent specification) to provide a hull structure which (a) has low tendency to upward lift under the influence of waves during movement of the vessel through the water, (b) is highly efficient and will allow the vessel to be propelled at high speeds, (c) will result in only a small reduction in speed in high seas, (d) has a high load resistance and will enable the vessel to be powered by means of any desired power means, including water-jet propulsion systems, and (e) has high stern stability so as to enable the vessel to be loaded and unloaded from the stern thereof.

As a preliminary to determining whether the solution of this technical problem as defined in claim 1 is novel and inventive it is necessary to consider in more detail what the ambit of some of the terms used in the claim is.

The statement that the width of the hull at the waterline "generally decreases in a forward direction" was introduced into the claim from the description. It has to be seen in the light of the statement already present in granted claim 1 that the width of the hull at the water line is "substantially greater in the afterbody of the hull than in the forward body of the hull" and also the statement in granted dependent claim 7 that the width of the hull at the water line is

"substantially constant in the case of the sternward quarter part of the vessel and then narrows towards the prow". Thus claim 7 admits of the possibility that there may be one quarter of the hull where the width at the water line does not decrease, which assists in giving a meaning to the term "generally" in the statement under consideration.

Indeed, if it is permissible that in one quarter of the hull there is no decrease in width at the water line, the Board can see no reason why the statement in question should exclude a small region, particularly when this is at the very stern of the vessel, where there is an increase in this width in the forward direction. In fact the respondents in no way sought to challenge that conclusion and conceded that the "Austal 18" hull, which exhibits such a small increase in width before tapering then over the rest of its length towards the prow, corresponded to this feature of the claim. At this point it should perhaps be emphasised that there has never been any dispute that the "Austal 18" hull belongs to the state of the art.

The second feature of the preamble of claim 1 requiring attention, concerning the cross-sectional shape of the hull "at the forward half of the hull", is more problematic and here there exists no consensus between the parties as to its meaning. The difficulty stems from the choice of the preposition "at". Having regard to the fact that in the preferred embodiment the stated cross-sectional shape of a bulbous underwater part and a narrow waisted part extending through the water line is present along the whole of the forward part of the hull, it might be possible to view the use of "at" as a minor linguistic infelicity and understand the feature,

in the light of the description, as indeed referring to the whole of the forward part of the hull. However, that approach would not coincide with how the respondents themselves believe the term should be understood.

In their view the reference to a particular cross-sectional shape "at the forward half of the hull" means that at least half of the forward half, considered sternwards from the prow, must have the defined shape. As a consequence they argue that the defined shape must be present at the position referred to in the characterising clause of the claim, ie at 75% of the total length of the underwater body of the hull calculated from the stern, and that the person skilled in the art would recognise the combination of the gravity centre point at this position and the presence there of the defined cross-sectional shape of the hull as being the essential prerequisite for obtaining the advantages associated with the invention. On the basis of that interpretation of the claim the feature involved had been wrongly placed in the preamble as it was not present in the "Austal 18" hull.

The Board is not convinced by the arguments of the respondents with respect to this feature. If the claim is not to be understood as meaning that the defined cross-sectional shape is present along the whole of the forward half of the hull then in the opinion of the Board the only acceptable alternative is that there is a portion of this half of the hull, of indeterminate but not insignificant length "at" or in which the required shape is present. On that basis and having regard to the evidence on file concerning the shape of the "Austal 18" hull (see in particular the documents

"A" to "D" filed with the statement of grounds of appeal and Mr Watson's report) the Board is satisfied that the feature involved is present in this known hull.

The first of the features stated in the characterising clause of claim 1 has also been criticised by the appellants as being essentially indeterminate, but the Board cannot agree. Although the language involved is indeed somewhat elliptic, the meaning becomes clear when reference is had to what is said about the sternwards half of the hull in the preamble of the claim. In particular, the requirement is that the vertical distance from the hull base line to the volumetric centre of gravity of the underwater part of the forward half of the hull is less than 55% of the normally occurring draft.

In any case, the appellants apparently had no great difficulty in understanding the numerical limitations stated in claim 1 when it came to determining the corresponding value for the "Austal 18" hull. According to document D7 the vertical distance from the hull base line to the volumetric centre of gravity for the sternwards half of the hull is 60.7% of the draft at midships at departure load, 62.4% at half-load and 64.0% at lightship load. The three corresponding values for the forward half of the hull are 56.8%, 56.5% and 56.1%. As for the vertical distance from the base line to the gravity centre point of the underwater frame area at a position 75% forwards from the stern the three values are 56.9%, 56.2% and 55.3% of the draft at midships, or if in the alternative the draft at the same position is taken as the relevant basis, 56.6%, 56.8% and 57.0%.

It can thus be seen that with regard to the position of the volumetric centre of gravity of the sternwards half of the "Austal 18" hull, this lies well within the limit specified in the preamble of claim 1.

Furthermore, as already explained above, the Board is satisfied the all of the other features specified in the preamble of claim 1 are present in the "Austal 18" hull as well. Accordingly novelty can only reside in the features specified in the characterising clause of the claim. As is apparent from the above the position of the volumetric centre of gravity of the forward half of the hull and the position of the gravity centre point of the underwater frame area 75% forwards from the stern indeed lie outside the respective limits set by the claim. Nevertheless, the appellants argue that the differences are so small and so lacking in any genuine technical effect that they should be ignored for the purposes of determining novelty. The Board cannot agree. The appellants have failed to provide any concrete evidence for their allegation that at certain loading conditions the parameters involved would actually fall within the claimed limits and the differences, although small, are by no means insignificant and totally lacking in any technical effect. as is in fact demonstrated by Mr Watson's report, see for example the graph on page 57 of "Annex B". The subject-matter of claim 1 is therefore novel.

Turning to the question of inventive step, it is not in dispute that the individual aims (b), (d) and (e) of the overall object of the invention quoted above are all achieved by the "Austal 18" hull. As regard the individual aims (a) and (c), ie providing a hull structure which has low tendency to upward lift under

the influence of waves thus resulting in only a small reduction in speed in high seas, these are inherent sea-keeping properties of the SWATH design concept. Given that the foremost part of the "Austal 18" hull already exhibits to some extent the SWATH-like characteristic of a bulbous underwater part and a narrow waisted part which extends through the water line, it was an obvious measure for the person skilled in the art further to improve the sea-keeping properties of the "Austal 18" hull by modifying the forward half of the hull to increase the degree of its SWATH-like shape. As is clear from the evidence on file, see for example pages 15 and 16 of "Annex B" of the above mentioned report, the amount and nature of the change in the hull shape required to bring it within the limits specified in the characterising clause of claim 1 lie within the normal design competence and freedom of the person skilled in the art.

The evidence relied upon by the respondents as showing that the claimed invention led to a dramatic improvement in sea-keeping properties, in particular by displacing the pitching centre forward, which evidence (found at pages 14 and 15 of document D7) essentially formed the basis for the finding by the Opposition Division of non-obviousness, relates to hulls the parameters of which are widely removed from the limits set by claim 1. In particular, on the basis of the documents provided by the respondents at the oral proceedings, the distance above the hull base line of the gravity centre point at the frame 75% forward from aft is for the vessel HSS 1500 40.7% of the draft and for the vessel HSS 760 42.4% of the draft. It is not however the obviousness of the corresponding hulls

which is up for consideration, but that of the hull defined in claim 1.

The subject-matter of claim 1 therefore lacks inventive step (Article 56 EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

S. Fabiani

F. Gumbel