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**Datasheet for the decision
of 15 December 2009**

Case Number: T 0038/08 - 3.2.01

Application Number: 01309841.3

Publication Number: 1211171

IPC: B63B 1/08

Language of the proceedings: EN

Title of invention:

Method for reducing wake making resistance at transom stern
and transom stern form

Patentee:

Kabushiki Kaisha Kawasaki Zosen

Opponents:

Kvaerner Masa-Yards Oy
Fr. Luerksen Werft GmbH & Co.KG

Headword:

-

Relevant legal provisions:

RPBA Art. 12(4)

Relevant legal provisions (EPC 1973):

EPC Art. 56

Keyword:

"Inventive step (yes)"

"Late submitted material - evidence admitted (no)"

Decisions cited:

-

Catchword:

-



Case Number: T 0038/08 - 3.2.01

D E C I S I O N
of the Technical Board of Appeal 3.2.01
of 15 December 2009

Appellant:
(Opponent 01)

Kvaerner Masa-Yards Oy
FI-00150 Helsinki (FI)

Representative:

Gustafsson, Aulis Valdemar
AWEK Industrial Patents Ltd Oy
P.O. Box 230
FI-00101 Helsinki (FI)

Respondent:
(Patent Proprietor)

Kabushiki Kaisha Kawasaki Zosen
1-1, Higashikawasaki-cho 3-chome
Chuo-ku
Kobe 650-8670 (JP)

Representative:

Musker, David Charles
R.G.C. Jenkins & Co
26 Caxton Street
London SW1H 0RJ (GB)

Party as of right:
(Opponent 02)

Fr. Luerssen Werft GmbH & Co. KG
Zum Alten Speicher 11
D-28759 Bremen (DE)

Representative:

Eisenführ, Speiser & Partner
Martinistrasse 24
D-28195 Bremen (DE)

Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted 26 October 2007
rejecting the opposition filed against European
patent No. 1211171 pursuant to Article 102(2)
EPC 1973.**

Composition of the Board:

Chairman: S. Crane
Members: J. Osborne
G. Weiss

Summary of Facts and Submissions

- I. The appeal by opponent I is directed against the decision posted 26 October 2007 rejecting the oppositions against European patent No. 1 211 171.
- II. In the contested decision the opposition division found *inter alia* that the subject-matter of the claims as granted was both novel and involved an inventive step in the light of *inter alia* the following evidence which played a role also during the appeal procedure:

D2: Hämäläinen *et al*, "*The wave damping aftbody revolutionizes aftbody design in all types of fast vessels*", Proceedings Vol. 2 IX Congress IMAM 2000, 2-6 April 2000, International Maritime Association of Mediterranean.

The opposition division disregarded in accordance with Article 114(2) EPC 1973:

D6: Ralmo Hämäläinen *et al*, "*Hydrodynamic Development for a Large Fast Monohull Passenger Ferry*", SNAME Transactions, Vol. 106, 1998, 413, 414, 420, 426.

- III. The following items of evidence were also introduced during the appeal procedure:

D7: US-A-6 038 995;

D8: "*Fast ro-ro ferries - the perfect fit for future markets*", The Naval Architect, February 1999, 25, 27;

D9: *"Grey Hounds of the sea"*, October 2005
http://www.moaa.org/magazine/October2005/f_greyhounds.asp;

D10: *"Historical Review of Cruiser Characteristics, Roles and Missions"*, March 2005
http://www.aandc.org/research/cruisers/cr_navsea.html;

D11: US-A-5 645 008;

D12: K.J. Rawson *et al*, *"Basic Ship Theory"* vol.II, 2nd edn., New York: Longman, 1979, 344-349.

IV. The patent specification as printed contained an error in that the term "stern" in the description and claims which formed the basis of the decision to grant became "stem". In reply to the statement setting out the grounds of appeal the respondent (patent proprietor) requested that the patent be maintained in amended form on the basis of description and claims in which the term "stem" was replaced by "stern" and claim 5 was amended for consistency with claim 1 (main request) or in the alternative that the appeal be dismissed (auxiliary request). At oral proceedings held on 15 December 2009 the board informed the respondent that correction of the erroneous printing of "stern" was a purely administrative matter and referred to Legal Advice 17/90, OJ EPO 1990, 260. The board furthermore expressed its opinion that the amendment of claim 5 in accordance with the respondent's main request related only to clarity and so was not occasioned by a ground for opposition. The respondent then filed a sole request that the appeal be dismissed.

- V. The appellant did not take part in the oral proceedings but had requested that the decision under appeal be set aside and the patent revoked. The party as of right (opponent II) took no part in the appeal proceedings.
- VI. Claims 1, 3 on the basis of which the patent was granted read:

"1. A method of reducing the wave making resistance of a displacement ship having a transom stern and a design speed corresponding substantially to a Froude Number of 0.2 to 0.4, the method comprising providing the hull of said ship with a longitudinal centre line profile (3, 4) having an inflection point (2) at a longitudinal distance of 0.1 to 10% L_{pp} (length between perpendiculars) from the stern end (5) of the ship, with the portion (3) of the hull profile forward of said inflection point sloping upwardly to said inflection point and the portion (4) of the hull profile rearward of the inflection point being horizontal or sloping downwardly, and positioning the lower end (5a) of the stern end relative to the design draught such that the ratio γ (H_a/H_b) of the distance (H_a) between the base line at the hull centre line and said lower end (5a) and the distance (H_b) between said base line and the design draught at the hull centre line is 0.95 to 1.2 such that, in use, a first flow condition is generated forward of said inflection point and a second flow condition is generated between said inflection point and said stern end to provide accelerated flow rearwardly of said inflection point."

"3. A displacement ship having a transom stern (5) and a longitudinal hull centre line profile (3, 4) defining an inflection point (2), with a portion (3) of the hull centre line profile forward of said inflection point sloping upwardly to said inflection point and the portion (4) of the hull centre line profile rearwardly of the inflection point ceasing to slope upwardly, characterised in that the ship has a design speed corresponding substantially to a Froude Number of 0.2 to 0.4, in that the longitudinal distance between the stern end (5) of the ship and said inflection point (2) is 0.1 to 10% Lpp (length between perpendiculars) and in that the lower end (5a) of the stern end (5) is positioned relative to the design draught such that the ratio γ (Ha/Hb) of the distance (Ha) between the base line at the hull centre line and said lower end (5a) of the stern end and the distance (Hb) between said base line and the design draught at the hull centre line is 0.95 to 1.2 such that, in use, a first flow condition is generated forward of said inflection point and a second flow condition is generated between said inflection point and said stern end to provide an accelerated flow rearwardly of said inflection point."

Claims 2 and 4 to 7 specify features additional to those of claims 1 and 3 respectively.

VII. The submissions of the appellant may be summarised as follows:

D6, D7 and D8 are introduced in appeal since they indicate more clearly that the basis for the present claims derives from conventional hydrodynamics.

D7 discloses that all features of claim 3 except for the ratio H_a/H_b were known in respect of a destroyer DDG51 forming earlier state of the art. It distinguishes between planing craft having Froude numbers higher than 0.4 and displacement ships such as the DDG51 and explicitly discloses speeds which would result in a Froude number within the presently claimed range. Although the claims specify a "design speed" Froude number, a ship may have various design speeds so that the term "design speed" is not a clear limitation. There is every reason to believe that the inflection point for the DDG51 falls within the claimed range because this is so large.

D6 relates to locating the stern end when using a trim wedge in a ship's aftbody. Extrapolation of a curve shown in figure 16 in combination with text on page 420 and also the teaching of figures 29 and 30 leads to a conclusion that the location of the stern end with a wedge form would be slightly above the design water line, thereby falling within the claimed range of ratio H_a/H_b .

D7 at least in combination with D6 therefore renders the subject-matter of claim 3 obvious. Moreover, the claimed range of the ratio H_a/H_b would result in an obvious manner from trial and error testing, particularly as the location of the stern end is determined in part by other factors.

D8 also discloses in figures 3 and 4 a ship having the features of claim 3 in as far as it teaches an inflection point as presently claimed, the stern end is positioned in accordance with the ratio H_a/H_b as

claimed and the ship has a Froude number of 0.373. The skilled person when putting the teaching of D8 into effect would no doubt arrive at the subject-matter of present claim 3.

D2 also teaches employing a trim wedge to damp stern waves and it is obvious to the skilled person that the stern end should be close to the water line. The position relative to the water line is indicated also by figure 29 of D6. D2 and D6 are by the same authors and relate to the same subject-matter, thereby rendering their combination obvious. The combined teaching results in a ship having all features of the present independent claims. It follows that D2 in combination with either D6 or D8 renders the subject-matter of the present independent claims obvious.

VIII. The respondent countered essentially that:

D2 has not been established as belonging to the state of the art. Even if it were to be, it fails to disclose not only a ship having a "design speed" as claimed but also the claimed location of an inflection point and range of the ratio H_a/H_b . The term "design speed" is defined in the patent specification and clearly differs from the actual speeds to which the appellant refers.

D6, D7 and D8 all are late-filed and should be disregarded since they are not highly relevant. In particular, none of them discloses the claimed ratio H_a/H_b . The patent relates to the problem of reducing stern wave-making resistance for slow vessels having a transom stern, namely cargo vessels. D6 in figure 16 relates to ships having a pram-type stern, not a

transom stern as presently claimed. It only shows the stern end immersion under the construction water line for Froude numbers higher than 0.43 and an extrapolation to below 0.4 is not possible. Figures 29 and 30 are purely schematic and allow no conclusions to be drawn as to the ratio H_a/H_b . D7 relates to a destroyer having a high design speed and a corresponding Froude number higher than 0.4, as is derivable from D9, D10 and D11. D8 contains no disclosure which would permit the skilled person to derive any of the presently claimed features relating to the inflection point, design speed or the ratio H_a/H_b .

Reasons for the Decision

1. The patent relates generally to reducing the power requirement for propelling ships by reducing the wave-making resistance of the stern. This is achievable with light, planing craft by trimming to lift the stern but that solution is not applicable to a displacement ship. In accordance with the patent the hull of such a ship having a transom stern is shaped to slope upwardly in a rearwards direction to an "inflection point" and thereafter continue horizontally or slope downwardly to the stern end. The inflection point is located within a distance from the stern end specified as a proportion of the length of the ship and the positions of the lower end of the stern end and the design draught relative to the ship's base line are within a specified relationship.

2. The appellant's submissions rely on the newly cited evidence D6 to D8, in part in combination with D2. D6 was already disregarded by the opposition division as being late-filed and insufficiently relevant. The appellant does not suggest that the citation of D6 to D8 is a response to a change in the proceedings but merely states that they are considered to be better evidence than that on which it previously relied. Under these circumstances D6 to D8 constitute evidence which "could have been presented or ... [was] not admitted in the first instance proceedings" and it is within the power of the board to hold them inadmissible (Article 12(4) RPBA). Consideration of whether to do so must be performed in the light of the evidence which was present in the opposition proceedings and on which the appellant now relies, namely D2. D2 is an extract from the proceedings of a conference which took place some 7 months earlier than the priority date for the present patent. The respondent challenges whether the document was available to the public before the priority date and if not, whether it correctly represents the information which was made public at the conference. However, these matters may be left in abeyance because, as set out below, the board finds that D2 either alone or in combination with any of D6 to D8 would not prejudice the maintenance of the patent.
3. D2 relates generally to the concept of reducing wave-making resistance of the stern of displacement ships and in the particular context of a fast RO-RO passenger ferry and a cruise liner. The presently claimed parameters H_a and H_b are dimensions to the base line of the ship which is not shown in D2 but conventionally would be located at the keel. It follows that the

claimed range of 0.95 to 1.2 for the ratio H_a/H_b represents a location of the lower end of the stern end which would be generally at or above the design water line. Whilst the appellant accepts that D2 is silent as regards the ratio H_a/H_b it argues that it nevertheless would be evident to the skilled person that the lower end of the stern end would be close to the water line, either above or below it. However, the appellant provided no explanation as to why it would be an obvious act for the skilled person to adopt a location within the claimed range and the case which it presents amounts, in this respect, to an unsubstantiated allegation. Since the authors of D2 apparently did not even consider the location of the lower end of the stern end relative to the design water line as a relevant parameter, the appellant's allegation in the absence of supporting reasoning that setting this parameter within the claimed range would result from trial and error testing cannot be accepted. The appellant did state that the positioning of the lower end of the stern end would be determined in part by other factors but gave no further information in this respect so that the argument cannot be considered in further detail.

4. In the light of the foregoing it is evident that consideration of D6 to D8 will be of value only if they contain any matter which would render obvious setting the ratio H_a/H_b within the claimed range. D6 relates to reducing propulsion resistance in a large, fast monohull passenger ferry. Figure 16, to which the appellant refers, shows a graphical plot of parameters relating to the stern end but only for a Froude number of at least 0.43 whereas the highest mentioned in D2 is

- 0.348. The appellant accepts that D7 contains no explicit information as regards the ratio H_a/H_b and does not rely on it in respect of that feature. As regards D8, whilst the appellant asserts that in the figures "the stern end is roughly at the level of the water line", that neither apparently corresponds to the range specified by the present claims nor would act as motivation to the skilled person to arrive at a value within that range. It follows that none of D6, D7 and D8 contains any matter which would render obvious the choice of the ratio H_a/H_b within the claimed range and the board therefore holds them inadmissible.
5. The remaining items of evidence D9 to D12 which were introduced during the appeal procedure were filed in response to questions raised concerning the interpretation of the feature "design speed substantially corresponding to a Froude Number of 0.2 to 0.4" in claims 1 and 3, particularly as to whether the destroyer DDG51 acknowledged in D7 would fall under this definition. However, as set out above, the appellant has failed to show that it would be obvious for the skilled person to arrive at the claimed range of the ratio H_a/H_b . Under these circumstances the interpretation of the feature specifying the design speed is not determinative to the outcome of the considerations on inventive step and the content of D9 to D12 need not be considered.
6. On the basis of the foregoing the board finds that the subject-matter of claims 1 and 3 involves an inventive step. Since claims 2 and 4 to 7 contain all features of claims 1 and 3 respectively the same conclusion applies equally to them.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

A. Vottner

S. Crane