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File Number: T 551/90 - 3.2.1

Application No.: 84 106 057.7

Publication No.: 0 128 446

Title of invention: Selectively controlled dual delivery pump, particularly
for motor vehicle application

Classification: B60S 1/48, F04D 29/50

D E C I S I O N
of 14 April 1992

Proprietor of the patent: MES S.A.

Opponent: 01) VDO Adolf Schindling AG
02) SWF Auto-Electric GmbH
03) Hella KG Hueck & Co.

Headword:

EPC Article 56, 123(2) and 123(3)

Keyword: "Allowability of amendment of claim by incorporating features from
drawing (yes)"
"Inventive step (yes)"

Headnote



Case Number : T 551/90 - 3.2.1

DECISION
of the Technical Board of Appeal 3.2.1
of 14 April 1992

Appellant :
(Opponent 01)

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Representative :

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Appellant :
(Opponent 02)

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Appellant :
(Opponent 03)

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Respondent :
(Proprietor of the patent)

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Representative :

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Decision under appeal :

Interlocutory decision of the Opposition Division
of the European Patent Office dated 3 May 1990,
and posted on 25 June 1990, concerning
maintenance of European patent No. 0 128 446 in
amended form.

Composition of the Board :

Chairman : F. Gumbel
Members : S. Crane
W.M. Schar

Summary of Facts and Submissions

- I. European patent No. 0 128 446 was granted on 8 April 1987 on the basis of European patent application No. 84 106 057.7.
- II. The patent was opposed by the Appellants (Opponents 1 to 3) on the grounds that its subject-matter was not novel and/or lacked inventive step with regard to the state of the art (Article 100(a) EPC).

The following documents were cited as relevant state of the art:

- (D1) DE-A-3 023 897
- (D2) FR-A-1 142 593
- (D3) US-A-3 807 426
- (D4) DE-A-2 434 492
- (D5) GB-A-1 500 784
- (D6) US-A-2 916 997.

- III. By its decision taken at oral proceedings on 3 May 1990 and issued in written form on 25 June 1990 the Opposition Division found that the patent was to be maintained in amended form.
- IV. The first Appellants (Opponents 1) filed an appeal against this decision on 7 July 1990 and paid the appeal fee on the same day. Their Statement of Grounds of Appeal was filed on 16 August 1990. In this statement reference was made to a further prior art document viz.

- (D7) US-A-2 864 312.

The appeal of the second Appellants (Opponents 2) together with the appeal fee was received on 21 August 1990. Their Statement of Grounds of Appeal was received on 4 October 1990.

The appeal of the third Appellants (Opponents 3) was received, together with the Statement of Grounds, on 12 July 1990, the appeal fee also being paid at the same time.

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

With letters dated 24 July 1991 and 9 September 1991 the first Appellants requested that the proceedings be stayed until the Enlarged Board of Appeal had issued its decision in the matter of referral G 1/91 concerning the question of unity of invention in opposition proceedings.

The second Appellants requested the reimbursement of the appeal fee having regard to Decision T 73/88 (Headnote published in OJ EPO 1990, 05).

- VI. With a letter received on 23 February 1991 the first Appellants referred to a further prior art document, viz.

(D8) VDO-Information, Scheibenwaschanlagen,
VDO Adolf Schindling AG, September 1975, pages 5 and
6.

- VII. In a communication pursuant to Article 11(2) RPBA dated 18 September 1991 the Board expressed its doubts as to whether all of the features incorporated into Claim 1 could be derived from the original disclosure and whether all of the features incorporated into the preamble of this claim were to be found in the state of the art on which it was based, viz. document D2.

No reason could be seen for staying the proceedings as the subject of Enlarged Board of Appeal proceedings G 1/91 appeared to have no relevance to the present case.

VIII. Oral proceedings were held on 14 April 1992. The second Appellants, although duly summonsed, did not attend these oral proceedings, as they had already indicated with their letter dated 2 April 1992.

IX. At the oral proceedings the Respondents (Proprietors of the patent) filed a new set of documents comprising Claims 1 to 5, description and drawing on the basis of which they requested the maintenance of the patent in amended form.

Claim 1 is worded as follows:

"A selectively controlled dual delivery pump with two delivery manifold duct means (26, 27), particularly for motor vehicle application, wherein the pump includes an impeller (14) arranged in an impeller chamber (15) of a pump casing (16) in which a collecting chamber (19, 20) is provided in communication with the impeller chamber (15) and with said delivery manifold duct means (26, 27), said impeller being selectively driveable in opposite directions, shutter means (23) being provided in said collecting chamber (19, 20) for selective cooperation with valve seats (24, 25) provided therein in opposite positions to each other, said shutter means (23) being arranged between said valve seats and alternatively preventing the flow of liquid through one of said delivery manifold duct means (26, 27), said shutter means being constituted by an elastic membrane (23) arranged between said valve seats (24, 25) and separating said collecting chamber into two collecting compartments (19, 20), each of said collecting compartments (19, 20) communicating with said impeller chamber (15) through respective conduits (21, 22) opening in mutually opposite directions into said impeller chamber (15), whereby when the impeller (14) is

rotated in one direction a pressure difference acting on said elastic membrane (23) is induced between said collecting compartments (19, 20) urging said membrane (23) in sealing engagement with one of said valve seats (24, 25), respectively, thereby shutting off one of said delivery manifold duct means (26, 27) and maintaining open the other of said delivery manifold duct means (26, 27), respectively, for liquid passage therethrough and vice versa when the impeller is rotated in the opposite direction, and whereby the collecting compartments (19, 20) are arranged laterally to the impeller chamber (15) and wall means (219, 220) are provided between the collecting compartments and the impeller chamber, characterized in that the membrane (23) lies in a plane substantially perpendicular to the axis of the impeller, in that one side of the wall means forms a smooth streamlined continuation of the circular inner surface of the impeller chamber, and in that said conduits (21, 22) pass through the wall means to open tangentially into said impeller chamber, whereby one conduit (21) lies below and the other conduit (22) lies above said plane of the membrane and said conduits extend towards the central area of the membrane when viewed in a direction perpendicular to said plane."

Dependent Claims 2 to 5 relate to preferred features of the pump according to Claim 1.

- X. The arguments presented by the Appellants, insofar as these are still relevant to the documents submitted at the oral proceedings, can be summarised as follows:

The main purported basis for the amendments made to Claim 1 was the drawing. Although, as established by Decision T 169/83 (OJ EPO 1985, 193), incorporation into a claim of a granted patent of features found only in a drawing was in principle allowable, the amendments made

in the present case did not meet the criteria set out in that decision since the features involved were not clearly, unmistakeably and fully derivable from the drawing in terms of structure and function, did not serve solely further to define elements already present in the claim but introduced completely new elements, and lastly would not have been recognisable by the skilled man as being part of the invention.

In particular, since Figures 1 and 3 of the drawing were clearly inconsistent with each other, although they were supposed to represent different sectional views through the same pump, then any information contained in them had to be treated with due caution and they should be considered in effect as being purely schematic. Thus, the "wall means" separating the impeller chamber from the collecting chamber were shown in Figure 1 as being separate components inserted into the pump casing, whereas according to Figure 3 they were integral with the pump casing. It was therefore inappropriate to take Figure 3 as showing the definitive form of the "wall means" with respect to the shape of the side wall thereof facing the impeller chamber. In any case, no "wall means" of any form were mentioned in the granted Claim 1.

With regard to the disposition of the conduits these were not shown in the longitudinal section of Figure 1 so that their location in the axial direction of the pump was not clearly defined. The fact that one conduit entered the lower part of the impeller chamber and the other conduit the upper part had only been disclosed in combination with an impeller having twice the axial extent of that normally used. This feature should also therefore appear in the amended Claim 1 as should the feature that each conduit lies completely above or below the plane of the membrane.

Even if there were a basis for the feature that the membrane is arranged in a plane perpendicular to the axis of the impeller, which was denied, the skilled man would recognise that this feature could not contribute to the solution of the stated problem of reducing pressure loss, and therefore would not have considered it as forming part of the invention as this was originally disclosed. That this was the case could be seen by an analysis of the pressure drop to be expected with the valve mechanism of the claimed pump in comparison with the prior art arrangement as shown in document D2 in which the membrane was in a plane parallel to the axis of the impeller. Such an analysis could readily be performed by the skilled man on the basis of pressure drop coefficients to be found in standard textbooks, such as

(D9) Ölhydraulik, Grundlagen und Anwendung, Chaimowitsch, pages 32 to 43,

and showed that the overall pressure drop of the claimed invention was in fact higher than in the prior art arrangement.

Since this was so clear it was unreasonable to expect the Appellants to perform strict comparative tests to demonstrate it. The actual comparative test performed by the Appellants had been criticised by the Respondents because of certain minor differences between the pumps involved, such differences were however in no way reflected in the features of Claim 1.

A pump having all the features of Claim 1 apart from the specified arrangement of the membrane would result from an obvious combination of the teachings of documents D2 and D7. Since it had been demonstrated that the claimed arrangement of the membrane did not contribute to the solution of the problem this should be ignored when

evaluating inventive step. It was not denied that the claimed pump had some advantages over the prior art but these advantages had nothing to do with reducing the pressure loss as alleged by the Respondents and resided instead solely in constructional details that facilitated moulding of the components of the pump and their assembly. This constructional consideration did not go beyond the normal competence of the skilled man.

Furthermore, since the features added to granted Claim 1 were not recognisable as being constitutive features of the invention defined therein the scope of protection had been shifted laterally thus infringing Article 123(3) EPC and the subject-matter of the amended claim lacked unity with that of the granted claim which could infringe against Article 82 EPC.

XI. The arguments of the Respondents in reply can be summarised as follows:

It had to be remembered that the drawing of a patent application or specification was intended to illustrate the invention and not as a detailed production blue-print and would be interpreted by the skilled man accordingly. Thus, the minor discrepancies between Figures 1 and 3 of the drawing in the present case did not rob them of their significant information content. Furthermore, the features added to Claim 1 were not derived solely from the drawings but were supported to a large extent by corresponding statements in the original description.

The attempt by the Appellants to show that the claimed arrangement of the membrane would lead to higher pressure losses than in the prior art according to document D2 was artificial and based on theoretical considerations divorced from technical reality. Moreover, the pump according to document D2 was inefficient because the

membrane extended into the impeller chamber and thus restricted the diameter of the impeller and this factor had not been taken into account by the Appellants. The actual comparative results submitted by the Appellants did not compare the claimed invention with the closest prior art according to document D2 but with a hypothetical state of the art conceived by the Appellants in the light of the claimed invention. Furthermore, the two pumps tested differed with respect to the form of the membrane and the opening clearance of the valve so that the results were in any case meaningless.

The arrangement of the membrane, wall means and conduits specified in the characterising clause of Claim 1 combined to give a pump of the type specified in the preamble of the claim which operated efficiently with low pressure losses.

Reasons for the Decision

1. All three appeals meet the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC. They are therefore admissible.
2. Allowability of the amendments

In Decision T 169/83 (supra), which has been relied upon by the Appellants, it was found after detailed consideration of various provisions of the EPC that in deciding whether the inclusion of features from a drawing into a granted claim was allowable it was only necessary to consider whether the amendments made contradicted the legal principles of Articles 123(2) and (3) EPC (see point 4.4 of the grounds).

According to this decision, see points 3.5 to 3.7 of the grounds, the requirements of Article 123(2) EPC are to be seen as being met if the features involved are clearly, unmistakably and fully derivable from the drawings as regards their structure and function and in no way contradict the other parts of the disclosure. This view has been confirmed by a number of subsequent decisions (e.g. T 443/89 and T 308/90, both not published) and now forms part of the established jurisprudence of the Boards of Appeal.

Valid Claim 1 includes three groups of features that have to be analysed for their conformity with the conditions set out above. These are:

- (a) the arrangement of the membrane.
 - (b) The presence and form of wall means between the impeller chamber and the collecting chamber.
 - (c) The disposition of the conduits.
- (a) It is clear from Figure 1 of the drawing that the membrane lies substantially in a plane which coincides with the section line III-III, this line being perpendicular to the longitudinal axis of the pump and the impeller of the pump being arranged along this axis. In other words it can be seen that the membrane lies in a plane substantially perpendicular to the axis of the impeller as is now stated in present Claim 1. Implicit support for this statement can also be found in the original description at page 5, paragraph 2, where it is indicated that the manifold or collecting compartments have their axes parallel to that of the impeller housing, it being clear from the drawing that the membrane is arranged substantially perpendicular to the axes of these compartments.

- (b) Although granted Claim 1 does not specifically mention the presence of wall means between the impeller chamber and the collecting chamber it is evident that such wall means must be provided if the pump is to function so that this feature can be considered as being implicit in the granted Claim 1. As can be clearly seen in the view of Figure 3 the side of the wall means facing the impeller chamber forms a smooth streamlined continuation of the circular inner surface of that chamber, as stated in present Claim 1. As pointed out by the Appellants Figures 1 and 3 of the drawing are inconsistent as to whether the wall means are integral with the impeller housing or constituted by separate elements located in the housing. In the opinion of the Board this inconsistency cannot however detract from the unambiguous teaching of Figure 3 with regard to the form of the wall means, it being irrelevant in this respect whether the wall means are integrally formed with the housing or not.
- (c) It was stated in the original disclosure that the conduits are arranged tangentially to the impeller chamber. According to present Claim 1 this statement has been amplified to indicate that one conduit lies above and one below the plane of the membrane and that the conduits extend towards the central area of the membrane when viewed in a direction perpendicular to that plane. Support for the location of the conduits on respective sides of the membrane is to be found not only in the drawing but also in the original description at page 6, lines 15 to 20 according to which one conduit opens into the upper half of the impeller chamber and one into the lower half. Since it is clear from Figure 1 of the drawing that the plane of the membrane substantially bisects the impeller chamber in the axial direction

thereof it is evident that one conduit must lie above this plane and one below. The fact that the conduits extend towards the central area of the membrane is unmistakably shown in the view of Figure 3 which is along a direction perpendicular to the plane of the membrane, thus corresponding to the wording of Claim 1 in this respect.

The Appellants accept that the disposition of the conduits as now defined in Claim 1 can be derived as such from the drawing but argue in effect that the relevant features incorporated into the claim are an arbitrary selection among those possible so that an unallowable intermediate generalisation has been made. In particular, they say that the claimed disposition of the conduits has only been disclosed in combination with an impeller which has an axial extent twice that normally used, and that it should be specified that the conduits are disposed completely on one side or the other of the plane of the membrane. The Board is however satisfied that there is no strict requirement for the impeller to be of any particular axial extent, as demonstrated by a sketch presented by the Respondents in which a normal impeller is used. Furthermore, the fact that each conduit is disposed completely on a respective side of the plane of the membrane is in any case implicit since no other arrangement would make any technical sense. This view was explicitly confirmed by the Respondents at the oral proceedings.

Accordingly, having regard to the above detailed considerations, the Board comes to the conclusion that the amendments made to Claim 1 do not offend against the requirements of Article 123(2) EPC. Furthermore, in the present case the requirements of Article 123(3) EPC pose no problem since valid Claim 1 contains all the features

of granted Claim 1 and has clearly been restricted by the inclusion of the features involved. This being the case, no lateral shifting of the scope of protection has occurred, as has been alleged by the Appellants. The amendments are therefore allowable.

The Board cannot find any justification in the provisions of the EPC for the contention of the Appellants that the allowability of the amendments is also conditional on a further requirement, namely that it must have been immediately apparent to the skilled man from the original disclosure that these features contributed to the solution of the technical problem as presented therein. Contrary to the assertions of the Appellants, their contention is not supported by the reasoning of Decision T 169/83, upon which they have relied in this respect. Instead, as indicated in point 4.5 of the grounds of that decision, it is permissible during opposition proceedings to establish which features are essential to the solution of the problem and to include them in the claims.

The amendments made to the dependent claims and description are restricted to those necessary to bring these into agreement with new Claim 1. Since the claims and description of the granted patent do not contain any unallowable amendments with respect to the original application documents it follows that there are no formal objections to the documents corresponding to the request of the Respondents as submitted at the oral proceedings.

3. State of the art

The closest state of the art, on which the preamble of Claim 1 is based, is shown in Figure 5 of document D2. This prior art pump comprises a bellows-like membrane which is supported at one side of the impeller chamber in a plane which contains the axis of the impeller. The

support for the radially inward side of the membrane is located within the impeller chamber and has a substantially "T"-shaped cross-section the bar of the "T" defining with the wall of the impeller chambers short conduits which depending on the direction of rotation of the impeller direct a flow of liquid against one side or the other of the membrane. The membrane can move between two valve seats provided on respective opposed ends of two delivery outlet ducts.

Document D1, which is mentioned in the introductory description of the patent specification, relates to a dual delivery pump with a change-over valve member that is frictionally coupled to the impeller shaft and moved thereby against a valve seat on one or other of the delivery ducts.

Document D6, which is also mentioned in the patent specification, shows a dual delivery pump which instead of valve means utilises fixed vanes which direct the flow to one outlet or the other depending on the direction of rotation of the impeller.

Documents D4, D5 and D8 are essentially equivalent and show a bidirectional pump which is associated with a membrane type valve constituting an element which is separate from the pump.

In document D7 there is disclosed a dual delivery pump wherein respective membrane valve members are associated with valve seats provided at the ends of two conduits which enter the impeller chamber tangentially at opposite sides thereof. The two membrane valve members are functionally coupled by means of either a lever or a hydraulic link so that one will open when the other closes.

Document D3 relates to a general purpose valve with a membrane valve member.

4. Novelty

It is apparent from the above discussion of the state of the art that the subject-matter of present Claim 1 is novel. It is distinguished from the pump disclosed in Figure 5 of document D2 by the features specified in the characterising clause of the claim. Since novelty has not been at issue in the appeal proceedings further detailed elucidations on this point are unnecessary.

5. Inventive step

5.1 The Appellants have contested that the main technical problem as stated in the patent specification, which is to provide a pump having reduced power and pressure losses, is solved by the claimed construction. Although it was at the disposal of the Appellants to prove this contention by means of an appropriate comparative test they have instead attempted to demonstrate it by a theoretical calculation of the pressure losses to be expected with a pump as claimed in comparison with the prior art pump of document D2. They have not however succeeded in doing this to the satisfaction of the Board. The calculations presented at the oral proceedings assume a complex path for the liquid being discharged from a pump according to the invention and sums together the pressure loss coefficients to be expected along this path. It is however apparent that at least a significant proportion of the liquid would not follow such a path but would instead pass directly from the exit of the conduits to the valve seat without being required to travel around or up the wall of the valve seat before being discharged. Furthermore the calculation includes as a significant component a pressure loss coefficient for a bend in the discharge duct which

strictly speaking has nothing to do with the valve mechanism as such. When considering the prior art pump of document D2 the calculation assumes on the other hand that there is a simple reversal of flow in front of the membrane which given the practical construction involved seems somewhat unlikely. Furthermore, as pointed out by the Respondents, the Appellants have ignored the fact that the prior art pump would be made inherently inefficient due to the positioning of the membrane support within the impeller chamber necessitating a reduction in the diameter of the impeller.

- 5.2 The comparative test actually submitted by the Appellants is manifestly unsuitable for proving their allegations in the above respect since firstly, it is not clear whether the pump purported to conform with the invention actually does so with regard to the disposition of the conduits, secondly, the reference pump does not conform with the prior art shown in document D2 but is clearly superior thereto, and thirdly, the membranes utilised in the two pumps have different forms and are associated with valves having different clearances.
- 5.3 The further reasons advanced by the Appellants which in their opinion would lead to inefficient operation of the pump according to the invention, namely increased turbulence in the impeller chamber due to its doubled axial length and poor sealing of the edge of the membrane in the region of the conduits do not seem plausible to the Board and remain as purely unsubstantiated allegations.
- 5.4 Taking the above into account the Board is therefore satisfied that the technical problem of providing a simple, reliable dual delivery pump which functions efficiently with low power and pressure losses has been solved by a pump having the features specified in present Claim 1.

5.5 The principal attack of the Appellants on the inventive step of the claimed subject-matter was based on their allegation that the arrangement of the membrane did not contribute to the solution of the stated problem and accordingly, in their view, had to be ignored when assessing patentability. As shown above, however, this allegation has not been proved so that this attack must fail. It is in any case, in the opinion of the Board, based on a misconception of how the objective problem and solution approach, which according to the established jurisprudence of the Boards of Appeal is the one to be adopted when evaluating inventive step, operates. Be that as it may, the Appellants also advanced the view that the construction defined in Claim 1 would be arrived at by the skilled man in the exercise of routine considerations in respect of simplicity of moulding of the pump components and their subsequent assembly. The Board can find no basis for this in the prior art. Of the documents cited only two, that is D2 and D7, relate to a dual delivery pump in which membrane valve means are incorporated into the pump housing structure. In both of these documents the membrane or membranes are arranged in a plane which contains or is parallel to the axis of the impeller and the conduits leading from the impeller chamber to the collecting chamber extend substantially perpendicularly to the plane of the membrane. A corresponding perpendicular arrangement of the input ducts with respect to the plane of the membrane is also to be found in the membrane type valves disclosed in documents D3, D4, D5 and D8. It was only after the Respondents had decided to place the membrane in a plane perpendicular to the axis of the impeller with the conduits extending generally parallel to that plane, for which there is no counterpart in any of the prior art documents, that they could reap the benefits associated therewith as regards the simple manner in which the membrane can then be mounted between the cover and the body of the pump housing.

5.6 Accordingly, the Board comes to the conclusion that the subject-matter of Claim 1 as submitted at the oral proceedings cannot be derived in an obvious manner from the state of the art and therefore involves an inventive step (Articles 52(1) and 56 EPC). This claim, together with Claims 2 to 5 dependent thereon and the amended description and drawing also submitted at the oral proceedings, are therefore a suitable basis for maintenance of the patent in amended form.

6. Unity of invention

As pointed out by the present Board in an earlier decision T 101/88 (not published) there is no provision in the EPC requiring that unity of invention must exist between the subject-matter of a valid Claim 1 and an earlier version thereof so that the arguments presented by the Appellants in this respect do not need to be considered. For this reason, and since it was foreseeable that a decision of the Enlarged Board of Appeal in the matter G 1/91 would issue before the date appointed for oral proceedings in the present case, the request for a stay of the proceedings in the present case was refused. Decision G 1/91 of the Enlarged Board of Appeal was in fact issued on 9 December 1991 (Headnote published in OJ EPO 1992/03). It was decided that unity of invention was not an issue that could be considered in opposition proceedings.

7. Reimbursement of appeal fee

The request of the second Appellants was supported solely by a reference to Decision T 73/88 (supra). A question of law arising from this decision was subsequently referred to the Enlarged Board of Appeal which by its Decision G 2/91 of 29 November 1991 (Headnote published in the OJ

EPO 1992/01-02) established that an appeal fee cannot be refunded for the only reason that there was already another appeal in existence.

The request for reimbursement of the appeal fee must therefore be refused.

Order

For these reasons, it is decided that:

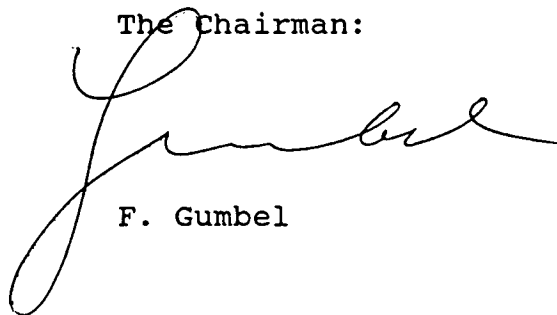
1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the claims, description and drawings submitted at the oral proceedings (see point IX above).
3. The request for reimbursement of the appeal fee is refused.

The Registrar:



S. Fabiani

The Chairman:



F. Gumbel

Handwritten notes:
P. 11
M. H.