BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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

D E C I S I O N
of 5 July 2001

Case Number: T 0503/98 - 3.3.5

Application Number: 90314235.4

Publication Number: 0448880

IPC: B01D 53/04

Language of the proceedings: EN

Title of invention:
Process and apparatus for recovering hydrocarbons from air-hydrocarbon vapor mixtures

Patentee:
John Zink Company, L. L. C.

Opponent:
Callidus Technologies, Inc.
Cool Sorption A/S

Headword:
-

Relevant legal provisions:
EPC Art. 52(1), 56, 123

Keyword:
"Main request: inventive step (no) - obvious to try"
"Auxiliary request: inventive step (yes) - non obvious modification"

Decisions cited:
-

Catchword:
-

Case Number: T 0503/98 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 5 July 2001

Other party: (Opponent)
Callidus Technologies, Inc.
7130 S. Lewis, Suite 635
Tulsa, Oklahoma 74136 (US)

Representative:
Heunemann, Dieter, Dr.
Vossius & Partner
Postfach 86 07 67
D-81634 München (DE)

Appellant: (Opponent)
Cool Sorption A/S
Ejby Mosevej 5
2600 Glostrup (DK)

Representative:
Christiansen, Ejvind
Hofman-Bang A/S
Hans Bekkevolds Allé 7
2900 Hellerup (DK)

Respondent: (Proprietor of the patent)
John Zink Company, L. L. C.
11920 East Apache
Tulsa, OK 74116 (US)

Representative:
Allen, William Guy Fairfax
J.A. Kemp & Co.
14 South Square
Gray's Inn
London WC1R 5LX (GB)

Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 20 March 1998 rejecting the opposition filed against European patent No. 0 448 880 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: R. K. Spangenberg

Members: A.-T. Liu
J. P. B. Seitz

Summary of Facts and Submissions

I. The appeal is from the decision of the opposition division rejecting two oppositions against European patent No. 0 448 880. The set of claims as granted consisted of independent claim 1 for a process, with claims 2 to 5 depending thereon and independent claim 6 for an apparatus, with claims 7 to 9 depending thereon. The independent claims 1 and 6 read as follows:

"1. A process for recovering hydrocarbons from an inlet air-hydrocarbon vapor mixture comprising the steps of:-

a flowing said inlet mixture through a first bed (12) of solid adsorbent having an affinity for hydrocarbons whereby hydrocarbons are adsorbed on said bed and a residue gas stream comprised of substantially hydrocarbon-free air is produced;

b venting said substantially hydrocarbon-free air;

c evacuating a second bed (14) of solid adsorbent having hydrocarbons adsorbed thereon by vacuum pumping with a liquid seal vacuum pump (72) whereby a major portion of said hydrocarbons are desorbed from said bed and a hydrocarbon-rich air-hydrocarbon vapor mixture is produced from said second bed;

d further evacuating said second bed by vacuum pumping with an additional pump connected upstream and in series with said liquid seal pump (72), while continuing to pump with said liquid seal vacuum pump, whereby additional hydrocarbons are desorbed from said bed;

e removing a major portion of the hydrocarbons contained in the air-hydrocarbon vapor mixture from said second bed (14) therefrom whereby a residue gas stream comprised of air and a minor portion of

hydrocarbons is produced;

f combining said residue gas stream produced in step e with said inlet air-hydrocarbons mixture of step a whereby hydrocarbons contained therein are adsorbed on said first bed (12) of solid adsorbent;

g introducing a quantity of hydrocarbon-free purge air into said second bed while evacuating said bed whereby additional hydrocarbons are stripped from said bed and additional air-hydrocarbon mixture produced, and

h periodically changing the flow pattern of said inlet air-hydrocarbon mixture and changing the bed of solid adsorbent being evacuated whereby when the bed through which the inlet air-hydrocarbon mixture is flowing becomes loaded with adsorbed hydrocarbons, the inlet air-hydrocarbon mixture is caused to flow through the bed which has just been evacuated and stripped; characterised in that said continuously operating rotary blower works as said additional pump (68) and in that during step c the valve (73) in the bypass conduit (71) for the additional pump (68)is open and the vacuum in the second bed is created by the liquid seal pump (72) alone.

6. Apparatus for recovering hydrocarbons from an air-hydrocarbon vapor mixture comprising:-

a a pair of adsorbers (12,14) containing beds of solid adsorbent having an affinity for hydrocarbons and having first and second connections on opposite sides of said beds;

b first conduit (28,30) means connected to the first connections (16,20) of said adsorbers (12,14) for conducing (sic) said air-hydrocarbon vapor mixture to said adsorbers and for evacuating said adsorbers;

c valve means (32,34) disposed in said first

conduit means for selectively causing said air-hydrocarbon vapor mixture to flow through one or the other of said adsorbers;

d second conduit means (46,48) connected to the second connections (18,22) of said adsorbers for venting residue gas exiting said adsorbers;

e second valve means (50,52) disposed in said second conduit means for selectively causing the second connections of one or the other of said adsorbers to be open for venting the air;

f a liquid seal vacuum pup (72) having a suction connection (74), a discharge connection (76) and a seal liquid inlet connection (78);

g third conduit means (42) connected between the suction connection of said liquid seal vacuum pump and said first conduit means connected to said adsorbers;

h third valve means (38,40) disposed in said third conduit means for selectively communicating one or the other of said adsorbers with the suction connection of said vacuum pump;

i hydrocarbon removal means (84,86,387) for removing hydrocarbons from an air-hydrocarbon vapor mixture having an air-hydrocarbon vapor mixture inlet connection (82), a residue gas outlet connection (10), and a liquid hydrocarbon outlet connection (96);

j fourth conduit means (80) connected between the air-hydrocarbon vapor mixture inlet of said hydrocarbon removal means and the discharge connection of said liquid seal vacuum pump; and

k fifth conduit means (197) connected between the residue gas outlet connection of said hydrocarbon removal means and said first conduit means;

l sixth conduit means (36,62) connected to said adsorbers for conducing (sic) stripping air to said adsorbers; and

m fourth valve means (60,66) disposed in said sixth conduit means for selectively communicating one or the other of said adsorbers with stripping air,

n an additional vacuum pump (68) disposed in said third conduit means, characterised in that said additional pump(68) is a continuously operating rotary blower, in that a bypass conduit (71) is connected in parallel to said rotary blower (68) and in that a switching valve (73) is provided in said bypass conduit (71) to load and unload the rotary blower."

II. Of the prior art documents cited in the opposition proceedings, reference shall be made to the following in the present decision:

Z1: EP-A-22 315

Z3: The roots pump and its application im pumping sets, H. Lang, Pumps - Pompes - Pumpen 1978-136, pages 22 to 27

Z4: Selecting vacuum systems, J. L. Ryans and S. Croll, Chemical Engineering, 14 December 1981, pages 73 to 90.

Z5: Vacuum pumps and systems, A. A. Chambers and F. Rowland Dube, Plant engineering, 9 June 1977, pages 141 to 145.

III. The opposition division held that, starting from Z1 and confronted with the problem of better desorption of the used adsorbent and thus reduced hydrocarbon emission during adsorption, the skilled person had a number of possibilities. There was no clear hint in the available prior art which would lead to the choice of a rotary

blower as additional pump, to substitute the ejector jet pump used in Z1.

IV. In the statement of the grounds of appeal, the appellant (opponent Cool Sorption A/S) maintained that the subject matter of the granted claims lacked an inventive step. His arguments were essentially as follows:

- Z1 disclosed a method for improving the process of vapour recovery in order to meet stringent emission standards.

- The integral teaching of Z1 was that an inadequate evacuation of the adsorbent bed achieved by use of a liquid seal vacuum pump and purge air could be improved by supplementary evacuation using an ejector.

- The technical problem to be solved with respect of Z1 was to obtain a higher vacuum capacity and thus, to meet more stringent emission standards.

- It was well known in the art that rotary blowers were more efficient for drawing vacuum than mechanical pumps. It would thus be obvious to substitute the ejector according to Z1 with a rotary blower.

V. By letter of 19 June 2001, the respondent submitted the auxiliary request that the claims filed on 9 February 1998 during the opposition proceedings be taken into consideration. This set of claims consisted of amended independent claims 1 and 5 for a process and an apparatus, respectively, with dependent claims 2 to 4

and 6 to 7 substantially unamended with respect to claims 2, 3, 5, 7 and 9 as granted.

The independent claim 1 differs from claim 1 as granted in that the characterising portion now reads:

"... characterised in that said continuously operating rotary blower works as said additional pump (68) and in that during step c the valve (73) in the bypass conduit (71) for the additional pump (68) is open and the vacuum in the second bed is created by the liquid seal pump (72) alone; and

said first (112) and second (114) beds are each comprised of serially connected upstream (113) and downstream (115) beds, both of said upstream and downstream beds being evacuated by said liquid seal vacuum pump, but only said upstream bed being further evacuated."

Similarly, the independent claim 5 of the auxiliary request differs from claim 6 as granted in that the characterising portion now reads:

"...characterised in that said additional pump(68) is a continuously operating rotary blower, in that a bypass conduit (71) is connected in parallel to said rotary blower (68) and in that a switching valve (73) is provided in said bypass conduit (71) to load and unload the rotary blower; and in that each of said adsorbers containing beds of adsorbent of element (a) is comprised of a pair of serially connected upstream (113, 115) and downstream (112, 114) adsorbers containing upstream and downstream beds of adsorbent and having first (116,117,120,121) and second (119,118,123,122) connections, and said apparatus is

further characterised to include:

ninth conduit means (129,131) connected between said first connections (117,121) of said upstream adsorbers and said second connections (119,123) of said downstream adsorbers for conducting said air-hydrocarbon vapor mixture to said upstream adsorbers and for evacuating said upstream adsorbers;

fifth valve means (133,135) in said ninth conduit means for selectively communicating one or the other of said adsorbers with said booster pump (168); and said booster pump being disposed in tenth conduit means (143) connected between said ninth conduit means and said third conduit means."

VI. Oral proceedings were held on 5 July 2001 in the absence of the opponent - appellant Cool Sorption A/S and of the opponent Callidus Technologies, Inc., who was party as of right to the proceedings.

VII. At the oral proceedings, the respondent for the first time made reference to the following document which is cited in the patent in suit:

D1: US-A-4 066 423

VIII. The arguments of the respondent, submitted orally and in writing, may be summarized as follows:

- The appellant's formulation of the technical problem was wrong as it included pointers to the solution.

- The technical problem to be solved was the provision of a vapour recovery unit and process which should meet new emission standards and yet

operate economically.

- Not Z1 but rather D1 was the suitable starting point for assessing inventive step.

- Even if Z1 were taken as starting point for further development, it was not obvious to abandon the ejector jet pump which was an essential feature of Z1.

- Should the skilled person consider abandoning the ejector jet pump, there was no suggestion in the prior art to modify Z1 with the characterising features as stipulated in the independent claims.

- The additional feature of the booster pump operating only on upstream adsorbers provided further advantages not foreshadowed in the cited prior art.

IX. The appellant (opponent II) requested that the decision under appeal be set aside and that the European patent No. 0 448 880 be revoked.

The respondent (patentee) requested that the appeal be dismissed and that the patent be maintained as granted (main request) or on the basis of the auxiliary request filed with the letter dated 9 February 1998 (i.e. with remittal to the fist instance for further necessary adaptation).

Reasons for the Decision

Main request

1. *Inventive step*

1.1 Claim 1 is directed to a process for recovering hydrocarbons from an inlet air-hydrocarbon vapour mixture. The mixture is passed through a first bed which adsorbs the hydrocarbon and the residue gas vented. Simultaneously, a second bed is regenerated by evacuation for renewed use as an adsorbent bed. The purpose of the process is to remove the hydrocarbon from the mixture to such extent that the remaining air can be safely vented to the atmosphere (see patent in suit, page 2, lines 5 to 10).

1.2 Up to the oral proceedings of 5 July 1998, it had been common ground to regard Z1 as representing the closest prior art. This view is already reflected in the acknowledgement of Z1 in the patent in suit (page 3, lines 4 to 27) and in the wording of claim 1 which recites the features disclosed in Z1 in its preamble. The Board does not see any reason for deviating from this position.

In the process of Z1, an inlet vapour mixture generated by loading gasolene is passed through an adsorbent bed and vented. The used adsorbent bed is regenerated by first desorbing a major portion of adsorbed hydrocarbons with the use of a liquid seal vacuum pump. Additional hydrocarbons are then desorbed by further evacuating the bed with an ejector jet pump connected upstream and in series with the liquid seal pump (page 2, line 28 to page 3, line 7). As a result, the regenerated bed can adsorb the hydrocarbons from the inlet vapour mixture to the extent that air vented to the atmosphere has a hydrocarbon vapour content of less than 10 mg/l hydrocarbon per litre of gasoline loaded

(page 13, lines 22 to 26).

1.3 With respect to Z1, the technical problem to be solved can be seen in the provision of an improved vapour recovery process which allows the more stringent emission standards of 0.15 mg/l of hydrocarbon vapour per litre of gasoline transferred to be met (patent in suit, page 2, lines 38 to 49).

1.4 The solution proposed in claim 1 is a process essentially characterised in that, after a major portion of hydrocarbons has been removed in the initial phase with the use of a liquid seal vacuum pump, the same adsorbent bed is further evacuated with:

(i) a rotary blower which works as additional pump for the liquid seal vacuum pump,

(ii) whereby the rotary blower operates continuously with the valve in its bypass conduit being open during the initial phase of the regeneration cycle.

(see characterising features of claim 1)

1.5 It is undisputed that, according to the claimed process, the hydrocarbon vapour is removed to such extent so that less than 0.15 mg of hydrocarbons will be vented to the atmosphere per litre of gasoline loaded. The technical problem is thus effectively solved by the selection of the evacuation method for the process as claimed.

1.6 The remaining question is whether the claimed solution is obvious in view of the available prior art.

1.6.1 It is already recognised in Z1 that the completeness of the regeneration of the adsorption beds is dependent on the degree of vacuum produced in the beds and that the capacity of the beds is reduced in proportion to the amount of adsorbed hydrocarbons left after the regeneration (page 2, lines 4 to 10). On the other hand, there is no doubt that, in order to reduce the hydrocarbon emission, the capacity of the bed must be increased. Thus, the teaching of Z1 is nothing less than that a lower hydrocarbon emission will be obtained when a deeper vacuum is drawn at the regeneration step (see also patent in suit, page 6, lines 32 to 35). For this reason, the Board holds that the reduction of the technical problem as stated in point 1.3 above to one of providing higher vacuum capacity is not based on hindsight. Rather, it is justified by the analysis of the implicit prior art teaching according to Z1.

1.6.2 Re: characterising feature (i)

Use of rotary blower in addition to liquid seal pump

With knowledge of Z1, it is thus obvious that, when seeking to reduce the hydrocarbon emission, the skilled person would look for a vacuum pump or a pump system which is more efficient in creating the desired vacuum for regenerating the bed of adsorbent.

The respondent has not refuted that rotary blowers (or roots blowers) are well known as booster pumps in combination with other mechanical pumps, for example liquid seal pumps (also termed "liquid-ring" pumps). In fact, integrated pumping systems comprising a rotary blower and a liquid-ring pump are available as complete packaged units (see Z4, page 76, right hand column,

last full paragraph; page 88, Figure 16; page 89, left hand column, last two full paragraphs). In the Board's judgment, when searching for an appropriate vacuum system to improve the vapour recovery process of Z1, this readily available vacuum pump system is one of the first options the skilled person would try.

The Board does not ignore the fact that the prior art offers a number of pump systems which could be used to solve the present technical problem (see for example Z4, page 74, left hand column, subparagraph: "Process Vacuum" and page 89, left hand column, subparagraph: "Combination vacuum systems"). In the Board's judgment, however, the selection of one of the commercially available systems, taking into consideration their expected advantages and drawbacks, belongs to the routine tasks of the notional skilled person, not requiring inventive activity. In the present case, the skilled person has all the incentive he needs for considering testing the present pump system which is among the favoured devices when environmental factors are an issue (Z4, page 89, right hand column, penultimate full paragraph and page 90, right hand column, second full paragraph). This view is further confirmed by Z5 which also indicates that systems of a rotary blower backed by a liquid-ring pump have high pumping capacity and good vapour handling ability (Z5, page 145, right hand column, third full paragraph and last paragraph).

1.6.3 Re: characterising feature (ii)

Operation of the rotary blower

According to claim 1, the valve in the bypass conduit

is left open at the beginning of the regeneration cycle. In this manner, the continuously operating booster pump is unloaded so that, at this stage, vacuum is created by the liquid seal pump alone (patent in suit, page 6, lines 10 to 12). Such operation of the rotary blower is, however, entirely in line with the teaching of Z1 in which vacuum is also drawn in the initial phase by the liquid seal pump alone (see Z1, page 8, lines 27 to 29 in combination with page 10, lines 2 to 22).

1.6.4 Re: combination of features of claim 1

Z1 already teaches that the combination of the following measures is essential for reducing the hydrocarbon emission (page 10, lines 23 to 29):

(i) an initial evacuation (using the liquid seal pump alone),

(ii) the stripping of the bed with purge gas and

(iii) a further evacuation (using an additional pump)

The patent in suit relies on exactly the same principle for solving the same problem (page 6, lines 29 to 35). The only difference is that a rotary blower is used as additional pump in the process of claim 1 and not an ejector jet pump as in Z1.

The Board can accept the respondent's argument that, by letting the rotary blower operate continuously with the opened valve during the initial regeneration step, a deeper level of vacuum can be produced and a greater volume of purge air can be introduced. Both these

factors would lead to a better regeneration of the adsorbent bed. As is indicated above, however, the stipulated manner of operation corresponds to the teaching of Z1. The respondent has not argued and it is not plausible that the combination of features in claim 1, in particular the operation of the pump system as claimed, would result in any effect beyond that expected with the application of a rotary blower as booster pump.

1.6.5 The respondent has argued that the skilled person did not have any incentive to dispense with the ejector jet which constitutes an essential and integral part of the process according to Z1. Thus, he would improve the existing pumps or add another pump rather than replace the ejector jet with a rotary blower. At the priority date of the patent in suit, however, a number of custom-designed pretested systems were available as alternatives to the older systems linking steam ejectors (or similar devices) with liquid-ring vacuum pumps(see Z4, page 89, subparagraph headed "Combination vacuum systems"). It is therefore obvious that the skilled person would first test one of those systems when seeking to solve the present technical problem.

1.6.6 The respondent has submitted that a rotary blower has the tendency to overheat. It was therefore, in his opinion, not obvious for the skilled person to use it when dealing with inflammable hydrocarbons such as in the present process.

The working mechanism of rotary blowers and their application are explained in Z3. It is indicated that the pump heats up when it is overloaded. For protection against this overloading, it is for example recommended

to build in an overflow valve in a by-pass or to cool the pump with internal gas circulation (page 22, right hand column, last paragraph to page 23, left hand column, paragraph three and page 27, left hand column, paragraph 1). The skilled person is thus not only aware of the danger of overheating but also knows how to circumvent it. The Board, therefore, has strong doubt as to any existing prejudice against the use of a rotary blower in the present case.

1.6.7 The respondent has submitted that the commercial pump systems of liquid ring with rotary blower are not readily available with a by-pass for the rotary blower or at least the function of such by-pass is not the same as stipulated in claim 1.

In the Board's judgment, it is common in the art to equip a rotary blower with an overflow valve in a by-pass so it can work in every pressure region and continuous operation (Z3, page 23, left hand column, last paragraph). The respondent has not submitted that the process of claim 1 implies the use of a valve that is structurally different from the one discussed in Z3. The way it is operated as stipulated in claim 1 therefore cannot be regarded as involving an inventive step since this function is merely in conformity with the teaching of Z1 (see also points 1.6.3 and 1.6.4).

1.6.8 As corollary of the above, the Board has come to the conclusion that the subject-matter of claim 1 lacks an inventive step in view of Z1 and Z4, with general common knowledge as in Z3.

1.7 The Board would not have come to a different conclusion, had it followed the respondent and accepted

D1 as representing the closest prior art.

1.7.1 D1 is acknowledged both in Z1 (paragraph bridging pages 1 and 2) and in the patent in suit (page 2, lines 12 to 20). It is essentially directed to a process for recovering hydrocarbons from an air-hydrocarbon mixture expelled from a vented tank. The recovery is achieved by adsorption of the hydrocarbons and the adsorbing bed regenerated by evacuation with a liquid ring vacuum pump to desorb the hydrocarbon components therefrom (D1, claims 1 and 2).

1.7.2 Starting from D1, the technical problem remains the same as with respect to Z1, namely the provision of an improved vapour recovery process which allows the emission standards of 0.15 mg/l of hydrocarbon vapour per litre of gasoline transferred to be met (patent in suit, page 2, lines 38 to 49) or, de facto, the completeness of regeneration of the adsorbent bed through a better evacuation method (points 1.3 and 1.6.1).

1.7.3 The solution proposed in claim 1 is also characterised here by the choice of the pump system and their method of operation (compare point 1.4).

1.7.4 It is already apparent in D1 that, in order to avoid polluting the environment, the hydrocarbon should be recovered and that the problem of hydrocarbon recovery is related to the regeneration step (column 1, lines 5 to 26 and lines 46 to 49). It is further known from Z1 that the regeneration of the adsorption bed according to D1 is unsatisfactory since it is entirely dependent on the degree of vacuum produced by the liquid ring pump (Z1, page 2, lines 4 to 10). In the Board's

judgment, the skilled person must have then recognised that the method for recovering hydrocarbon according to D1 is practically obsolete.

1.7.5 The respondent has argued that any vapour recovery process, in order to be commercially viable, has to meet the constraint of 15 minutes cycle time. Since the new, lower hydrocarbon emission limit cannot be achieved within this cycle time when the adsorbent bed is regenerated according to the process of Z1, the skilled person would not start from this prior art.

The Board observes that the respondent has not given a plausible explanation as to why the cycle time constraint would deter the skilled person from applying the teaching of Z1 for solving the present problem. The respondent has in particular not submitted that the process of Z1 is in reality not improved with respect to D1. The Board also notes that prolonging the regeneration cycle time is not an option envisaged in Z1 for obtaining this improvement. On the contrary, this prior art apparatus is also expressly designed for an approximately 15 minutes cycle time (page 12, lines 12 to 13). The lower hydrocarbon emission, due to the better regeneration of the adsorbent bed, is clearly attributed to other factors (see Z1, page 10, lines 23 to 29 and point 1.6.4 above). Even if the method of Z1 is still not adequate for meeting the new emission standards, it cannot be denied that Z1 has recognised the principles for improving the regeneration step and thus, reducing the hydrocarbon emission. In the Board's judgment, it is only straightforward for the skilled person to apply these same principles to push the completeness of the bed regeneration further, with the aim to meet more

stringent emission standards. In doing this, he would have proceeded as set out in points 1.6.2 to 1.6.4 above and arrived at the subject-matter of claim 1. The finding in point 1.6.8 is therefore also valid when the assessment of inventive step is based on starting from D1.

Auxiliary request

2. *Amendments*

Compared to claims 1 and 6 as granted, claims 1 and 5 are now respectively limited by the features of claims 5 and 10 as originally filed. The amendments therefore do not contravene Article 123 EPC. This is not in dispute.

3. *Inventive step*

3.1 In view of the problem to be solved with respect to Z1, present claim 1 additionally stipulates the use of two serially connected upstream and downstream beds for each adsorption/desorption cycle. The pumps are set up and operated such that, whilst both beds are evacuated by the liquid seal vacuum pump, only the upstream bed is further evacuated with the booster pump.

3.2 The respondent has argued convincingly that the advantage with the booster pump operating only on the upstream adsorbent bed is that the bed concerned can be smaller. As a consequence, the size of this booster pump can be reduced.

3.3 The Board is satisfied that the present modification is neither disclosed nor foreshadowed in the available

prior art. This is undisputed. The claimed process can therefore be accepted as involving an inventive step.

3.4 Claim 5 is directed to an apparatus comprising all the parts necessary for carrying out the process of claim 1. Claims 2 to 4 and 6 to 7 are dependent claims relating to specific embodiments of the process according to claim 1 or those of the apparatus according to claim 5, respectively. The patent can therefore be maintained with these claims, after an adaptation of the description and drawings, whereby care should be taken to ensure a consistent use of reference signs.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside

2. The case is remitted to the opposition division with the order to maintain the patent with the following documents:

Claims 1 to 7 filed with letter dated 9 February 1998

Description and drawings to be adapted.

The Registrar: The Chairman:

G. Rauh R. Spangenberg