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D E C I S I O N
of 4 February 1999

Case Number: T 0388/97 - 3.2.1

Application Number: 91912236.6

Publication Number: 0487703

IPC: F16K 7/16, F16K 11/02

Language of the proceedings: EN

Title of invention:
Valve for controlling connection to branch passage

Patentee:
Saunders Valve Company Limited

Opponent:
Gebrüder Müller Apparatebau GmbH & Co. KG

Headword:
-

Relevant legal provisions:
EPC Art. 54(3), 56

Keyword:
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
T 0896/92

Catchword:
-

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Case Number: T 0388/97 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 4 February 1999

Appellant: (Opponent)
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Respondent: (Proprietor of the patent)
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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 5 February 1997 concerning maintenance of European patent No. 0 487 703 in amended form.**

Composition of the Board:

Chairman: F. Gumbel
Members: S. Crane
J. van Moer

Summary of Facts and Submissions

I. European patent No. 0 487 703 was granted on 24 August 1994 on the basis of European patent application No. 91 912 236.8.

II. The granted patent was opposed by the present appellants on the grounds that its subject-matter lacked novelty and/or inventive step with respect to the following state of the art documents:

(E1): Patent abstracts of Japan JP-A-62-151676,

(E2): Catalogue "PURE-FLO Diaphragm Valves" of the Company ITT Fluid Technology Corporation.

III. With its decision posted on 5 February 1997 the Opposition Division held that the patent could be maintained in amended form.

IV. An appeal against that decision was filed on 4 April 1997 and the fee for appeal paid at the same time. The statement of grounds of appeal was filed on 4 June 1997.

In the statement of grounds the appellants referred to the document WO-A-91 00460, which belongs to the state of the art according to Article 54(3) EPC, and argued that the subject-matter of claim 1 as approved by the Opposition Division lacked novelty with respect thereto. The appellants also challenged the clarity of the claim as well as its basis in the original disclosure and maintained their objection of lack of

inventive step with respect to documents E1 and E2.

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

V. Oral proceedings before the Board were held on 4 February 1999.

At the oral proceedings the respondents (proprietors of the patent) submitted a new claim 1 which reads as follows:

"1. A valve (1) comprising: a valve body (2) defining a through passage (3), a branch passage (7), an aperture (11) in the wall of the through passage (3) for connecting the branch passage (7) to the through passage (3), and a valve seat (10) formed on the valve body (2), wherein the aperture (11) opens onto the valve seat (10) and the branch passage (7) opens onto the valve seat (10) at a point spaced from the aperture (11); and a closure diaphragm (12) movable between a first position in which the diaphragm (12) engages the valve seat (10) to seal the aperture (11) and the branch passage (7) and a second position in which the closure diaphragm (12) is spaced from the valve seat (10), whereby communication is established between the through passage (3) and the branch passage (7); characterised in that, when the valve (1) is oriented with the through passage (3) horizontal and the branch passage (7) extending vertically downwardly away from the through passage (3), the surface of the body, which is located in a plane perpendicular to the longitudinal axis of the through passage (3) and passing through the centre of the aperture (11), and which connects the

invert of the through passage (3) to the valve seat, extends from the lowest point of the through passage substantially horizontally to the valve seat whereby all fluid previously contained in the valve body will drain into the branch passage when the diaphragm is in the second position and no pocket which is below the invert of the through passage is formed when the diaphragm is in the first position."

They requested maintenance of the patent in amended form on the basis of this new claim 1 together with the dependent claims 2 to 4 (as granted), revised description and drawings (as granted) as accepted by the Opposition Division in the contested decision.

VI. The arguments brought forward by the appellants in support of their request can be summarised as follows:

According to claim 1 the shape of the through passage in the valve body was defined by reference to a particular orientation of the valve body in use. The claim was however directed to a valve per se and not to that valve when forming part of a pipeline system with the valve arranged therein in the specified way. Moreover, it was made clear in the description of the patent specification that the valve could be used in other orientations. This made the claim unclear in contravention of Article 84 EPC.

It was not in dispute that document E3 disclosed a valve having all the constructional features set out in the preamble of present claim 1. Furthermore, it was clear from the description of the valve of document E3 that it had been designed to prevent the formation of

pockets or dead spaces in the flow line, which was the same technical problem addressed by the presently claimed valve. The person skilled in the art would therefore take this design purpose into account when ascertaining what it was that was intended to be shown in the figures of document E3. On that basis there could be no doubt that Figure 3 disclosed to the person skilled in the art the form of the through passage in the valve body as defined in the characterizing clause of claim 1. The subject-matter of the claim therefore lacked novelty.

That valves of the basic configuration set out in the preamble of claim 1 were useful in flow lines where it was desired to avoid the formation of pockets or dead spaces was taught by both documents E1 and E2. It was also clear from the latter document that such a valve could be used when it was desired to drain a flow line completely rather than merely to take a sample therefrom. At the bottom of page 14 of document E2 there was disclosed a valve clearly suitable for both draining and sampling purposes. The valve comprised a body welded to a short section of tubing which could be of a diameter varying over a wide range. At the upper end of this range it would be obvious to weld the valve body to the tubing section in such a way that the surface connecting the lowest point of the through passage in the tubing section to the valve seat extended "substantially horizontally", whatever that might mean, to the valve seat, as required by the characterising clause of claim 1. The subject-matter of the claim therefore lacked inventive step.

VII. The respondents replied substantially as follows:

The subject-matter of claim 1 was a valve which was particularly intended to be used in a certain configuration. For convenience the position of the valve in this configuration was adopted as the basis for defining its internal geometry. This did not mean that the valve could not be used in other configurations so that a further restriction of the claim in this context was unnecessary.

The various figures of document E3 were inconsistent with each other. Since the text of the document made no reference to use of the valve to provide complete draining of a flow line, the person skilled in the art would not in any way be led to the appellants' interpretation of Figure 3 as showing the true intention of the drafter of the document. Thus there was no clear and unambiguous disclosure in document E3 of the subject-matter of present claim 1.

The respondents had set out to design a valve which could be used both to drain a flow line completely and to take a sample therefrom without there being any pocket or dead space being formed in which suspended material could collect. As could be seen from document E2 these two functions had previously been reserved to different valves so that the very idea of combining them in a single valve was a distinct break with convention. There was nothing in the state of the art which could encourage the skilled person to start on the development path chosen by the respondents and to lead him to the solution claimed. The arguments of the appellants as to what might happen if the valve body shown at the bottom of page 14 were combined with a tubular section of larger diameter were pure *ex-post*

facto hypotheses.

Reasons for the Decision

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

2. *Considerations under Articles 84, 123(2) and 123(3) EPC*

As is made clear at lines 14 to 17, column 3, of the patent specification (the corresponding passage is found at lines 21 to 24, page 4, of the original application) the valve body of the claimed valve will in general be installed in a pipework system with the through passage horizontal and the branch passage pointing vertically downwards. It is with reference to this normal installation position that the surface of the valve body in the indicated perpendicular plane and connecting the lowest point of the through passage to the valve seat is defined in present claim 1 as being "substantially horizontal". It is by virtue of this form of the surface in question that all fluid present in the valve body will drain into the branch passage when the diaphragm is opened and that no pocket is formed below the invert of the through passage when the diaphragm is closed. The causal relationship between this surface being "substantially horizontal" and the valve being able to meet these two requirements is immediately evident to the person skilled in the art from the original disclosure even though not explicitly stated there. Furthermore, as argued by the

respondents, it is the nature of this relationship which imposes a limitation on the ambit of the term "substantially horizontal" to a surface which diverges from the horizontal only to the extent necessary for facilitating production.

What the respondent seek to protect is a valve. The internal geometric form of that valve is difficult to define except by reference to the effects to be achieved and in turn these effects are predicated upon the valve being oriented in a certain way. The respondents have therefore defined this orientation in the claim. It would be inappropriate to demand, as do the appellants under the mantle of Article 84 EPC, that the respondents restrict their claim to a pipework system comprising the valve orientated in this way since that would unwarrantedly limit the scope of protection given.

Thus the terms of present claim 1 are clear (Article 84 EPC) and since the claim has been derived from granted claim 1 only by the addition of features which were originally disclosed, there are also no objections to it under Articles 123(2) and (3) EPC.

3. *Novelty*

Document E3 was published after the priority date to which the subject-matter of present claim 1 is entitled but is itself entitled to an earlier priority date and therefore belongs to the state of the art according to Article 54(3) EPC for the majority of Contracting States designated in the contested patent. This is not in dispute. Nor is it in dispute that the valve

disclosed in document E3 is of the general type defined in the preamble of present claim 1.

The general teaching of document E3 is to provide a valve especially suitable for taking samples from or, injecting components into, a liquid flow in a pipeline. In particular the aim is to avoid the formation of any pocket or dead space so that there can be practically no entrapment of liquid during sampling or injecting operations, see for example page 2, paragraphs 3 to 5. The prevention of such entrapped pockets of liquid can be very important in certain fields of use, for example food processing and bio-technology. There is no mention in document E3 of using the valve disclosed there for draining a pipeline system, nor is the valve described or shown as being disposed in the draining orientation defined in present claim 1. However, as a corollary to what is said in point 2 above about the terms of the claim, the absence of this information in document E3 is not definitive for establishing novelty. What is important is whether the document contains a clear and unambiguous teaching to the person skilled in the art to construct the valve in such a manner that its internal geometry corresponds to that defined in the claim with the concomitant effect that, if the valve were used in the orientation defined in the claim then indeed all fluid previously contained in the valve body would drain from it.

Here, the appellants rely solely on Figure 3 of document E3 and to be more precise on the fact that the right-hand dotted line indicating the extent of the through passage in the areas of the valve body on either side of the chamber 50 is a straight

continuation of the side face 49 of that chamber. This side face corresponds to the surface defined in the characterising clause of claim 1 and in the orientation of the valve stated in the claim would extend substantially horizontally. Having regard to the dotted line mentioned above the appellants conclude that in this orientation of the valve there can be no part of the through passage which is lower than the side face 49 so that all of the fluid in the valve body will be allowed to drain into the branch passage.

Although the assertions of the appellants are consistent with what is shown in Figure 3 when this is considered in isolation, it is impossible to disregard the fact that Figures 1 to 3, which all purport to be different views of the same valve, are mutually inconsistent with regard to the possible form of the through passage in the valve body in the areas spaced from the chamber 50. It is possible to make conjectures about that form which would be compatible with various pairs of figures, but there is no one form which is compatible with all three. As the respondents have correctly pointed out if Figure 2 is assumed to illustrate a "D"-shaped cross-section which according to Figure 3 is constant along its length (the interpretation favoured by the appellants) then this would not correspond to the circular cross-section of the end of the passage clearly visible in Figure 1. The preferred interpretation of the appellants is that the "D"-shaped cross-section visible in Figure 2 blends slowly into the circular cross-section visible in Figure 1, which would be convenient for manufacturing purposes, and that the straight dotted line visible in Figure 3 arose merely as a matter of convenience for

the draughtsman.

The Board does not have to choose between these two versions or for that matter investigate other ones. It suffices to say that the evident discrepancies between the Figures makes it impossible to derive from Figure 3 a clear and unambiguous teaching that the valve shown there corresponds both in terms of structure and function to that defined in claim 1 (see decision T 896/92, cited in the compendium "Case Law of the Boards of Appeal of the EPO", 2nd edition, page 53). The subject-matter of present claim 1 is therefore novel with respect to document E3.

Its novelty with respect to documents E1 and E2 is no longer in dispute. Having regard to the valve shown in document E1, which was already referred to in the introductory description of the contested patent, it can be seen that if the valve were disposed in the orientation defined in present claim 1 then the lowest point of the through passage would lie below the level of the valve seat, thus preventing full drainage of the through passage. In contrast, considering the sampling valve shown at the bottom of page 14 of document E2, it can be seen that if this valve were disposed in the required orientation then there would indeed be full draining of the through passage when the diaphragm is open but on the other hand a pocket below the level of the invert will be formed when the diaphragm is closed. In both cases these effects are a direct consequence of the internal geometry of the valve body not being as required by the claim, namely with a substantially horizontally extending surface between the lowest point of the invert of the through passage and the valve

seat.

4. *Inventive step*

Having regard to the above considerations it is apparent that the issue of inventive step resolves essentially to the question whether there was anything in the state of the art which would encourage the skilled person to provide a valve of the type set out in the preamble of claim 1, such as disclosed in documents E1 or E2, with the internal geometry defined in the characterising clause of the claim, thus enabling the valve to be used for complete drain down as well as problem-free sampling.

The appellants see this encouragement in what is said at the bottom of page 14 of document E2 about the valve illustrated there. In particular they argue that it is proposed here to fabricate a range of valves which incorporate the same basic valve body welded to a tubular section of widely varying diameter, this tubular section thus defining the through passage of the valve within the terms of claim 1, and that once the diameter of that tubular section reaches a certain value then it would in practice only be possible to weld the valve body and the tubular section together in such a way that all the requirements of claim 1 would follow automatically. The Board cannot agree. This line of argument is based solely on hindsight knowledge of the claimed invention. In the opinion of the Board the person skilled in the art, on the assumption that the basic contention of the appellants concerning the incorporation of one size of valve body with different diameter tubular sections is correct, will still have

considerable design freedom as to how to arrange these parts with respect to each other the Board can see no clear technical reason which would force him to adopt the configuration foreseen by the appellants.

A second line of argument of the appellants is that the person skilled in the art would combine the features of the relevant valves of documents E1 and E2 in order to obtain a valve suitable for both complete drain down and sampling. Again the Board cannot agree since in neither document E1, nor in document E2 is there any actual suggestion of using the valve involved for drain down purposes.

Lastly, the Board can see no persuasiveness in an argument along general lines to the effect that the person skilled in the art, given the technical goal of providing a valve suitable both for complete drain down and problem-free sampling, would have no difficulty in modifying the valve of document E1 or that shown at the bottom of page 14 of document E2 accordingly and thus arrive at the internal geometry claimed. The main reason for this is that this technical goal is nowhere addressed in the state of the art so that the initial conception by the respondents of a single valve capable of being used for both of the indicated purposes has to be assimilated to their contribution to this art.

Taking all of the above into account the Board therefore comes to the conclusion that the subject-matter of present claim cannot be derived in an obvious manner from the state of the art and therefore involves an inventive step (Article 56 EPC).

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 following documents:

   Claim 1 submitted at the oral proceedings on 4 February 1999; claims 2 to 4, description and drawings as accepted by the first instance.

The Registrar: The Chairman:

S. Fabiani F. Gumbel