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D E C I S I O N
of 17 September 1998

Case Number: T 0834/96 - 3.2.1

Application Number: 88307538.4

Publication Number: 0310234

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Language of the proceedings: EN

Title of invention:

Hose fitting

Patentee:

Bridgestone Flowtech Corporation

Opponent:

Nitta Moore Company

Headword:

-

Relevant legal provisions:

EPC Art. 56, 100(b)

Keyword:

"Sufficiency of disclosure (yes)"

"Inventive step (yes)"

Decisions cited:

T 0206/83

Catchword:

-



Case Number: T 0834/96 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 17 September 1998

Appellant:
(Opponent)

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Decision under appeal:

**Interlocutory decision of the Opposition Division
of the European Patent Office posted 9 July 1996
concerning maintenance of European patent
No. 0 310 234 in amended form.**

Composition of the Board:

Chairman: F. A. Gumbel
Members: S. Crane
V. Di Cerbo

Summary of Facts and Submissions

- I. European patent No. 0 310 234 was granted on 6 July 1994 on the basis of European patent application No. 88 307 538.4.
- 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 state of the art (Article 100(a) EPC), that the invention was insufficiently disclosed (Article 100(b) EPC), and that there had been an inadmissible extension of subject-matter (Article 100(c) EPC). The last objection was dropped during the course of the opposition proceedings.

Of the prior art documents relied upon in the opposition proceedings only the following have played any significant role on appeal:

- (D1) GB-A-1 603 670
- (D2) US-A-4 282 175
- (D3) US-A-3 409 314
- (D8) US-A-4 445 714
- (D12) JP-A-5817193 (translation filed at the oral proceedings before the Board).

- III. With its decision posted on 9 July 1996 the Opposition Division held that the patent could be maintained in amended form. This decision was based on a set of claims 1 to 9 of which the independent claims 1, 4 and 8 read as follows:

"1. A hose fitting for sealed connection to a multilayer hose, comprising:

a first, one-piece cylindrical member (22) having a small diameter bore portion (22a) and a large diameter bore portion (22b) connected to said small diameter bore portion (22a), the small diameter bore portion (22a) being formed with an axial small bore (22a) extending therethrough and the large diameter bore portion (22b) being formed with an axial large bore (22d) extending therethrough;

a second cylindrical member (24) having a radial flange portion (24a) and an axial tubular portion (24c) extending from said radial flange portion (24a), the radial flange portion (24a) being axially slidable within the large diameter bore (22b) of said first cylindrical member (22), the radial flange portion (24a) being provided with a sealing member (29) which seals between said radial flange portion (24a) and said large diameter bore portion (22b) of said first cylindrical member (22), and the axial tubular portion (24c) being formed with a through bore (24b) communicating with said axial small bore (22a) of said small diameter bore portion (22a) of said first cylindrical member (22) and provided with a sealing member (30);

a sleeve (26) provided within said large diameter bore portion (22b) and having an inclined surface (26c);

a collet (28) provided within said large diameter bore portion (22b) and having an outer surface (28a) engageable with said inclined surface (26c) of said sleeve (26) and radially contractible when moving axially within said sleeve (26),

the multilayer hose being merely inserted and

firmly fixed between said collet (28) and said axial tubular portion (24c) of said second cylindrical member (24) by means of axial outward movement of said second cylindrical member (24) caused by internal fluid pressurisation of the hose fitting and also by means of axial outward movement of said collet (28) caused by said axial outward movement of said cylindrical member (24); and

a stop member (27) received in said large diameter bore portion (22b) and adapted to limit axial movement of said sleeve (26) and collet (28)."

"4. A hose fitting for sealed connection to a multi-layer hose, comprising:

a first, one-piece cylindrical member (22) having a small diameter bore portion (22a) and a large diameter bore portion (22b) connected to said small diameter bore portion (22a), the small diameter bore portion (22a) being formed with an axial small bore (22a¹) extending therethrough and the large diameter bore portion (22b) being formed with an axial large bore (22d) extending therethrough and an inner circumferential groove (22e);

a second cylindrical member (24) having a radial flange portion (24a) and an axial tubular portion (24c) extending from said radial flange portion (24a), the radial flange portion (24a) being axially slidable within the large diameter bore (22b) of said first cylindrical member (22), the radial flange portion (24a) being provided with a sealing member (29) which seals between said radial flange portion (24a) and said large diameter bore portion (22b) of said first cylindrical member (22), and the axial tubular portion (24c) being formed with a through bore (24b)

communicating with said axial small bore (22a¹) of said small diameter bore portion (22a) of said first cylindrical member (22) and provided with a sealing member (30);

a collet (28) having an outer surface (28a), and a radial flange portion radially outwardly extending from said outer surface (28a) and received in said inner circumferential groove (22e) of said first cylindrical member (22);

a sleeve (26) arranged between said second cylindrical member (24) and said collet (28) and axially movable within said large diameter bore portion (22b) of said, first cylindrical member (22), the sleeve (26) having an inner inclined surface (26c) engageable with said outer surface (28a) of said collet (28), the collet (28) being radially inwardly constrictible when said sleeve (26) is moving axially outwardly,

the hydraulic hose being merely inserted and crimped between said collet (28) and said axial tubular portion (24c) of said second cylindrical member (24) by means of axial outward movement of said cylindrical member (24) caused by internal fluid pressurisation of the hose fitting and also by means of axial outward movement of said sleeve (26) caused by said axial outward movement of said second cylindrical member (24); and

a stop member (27) received in said circumferential groove (22e) of said large diameter bore portion (22b) and adapted to limit axial movement of said sleeve (26) and collet (28)."

"8. A hose fitting (55) for sealed connection to a multilayer hose, comprising:

a first, one-piece cylindrical member (22) having a small diameter bore portion (22a) and a large diameter bore portion (22b) connected to said small diameter bore portion (22a), the small diameter bore portion (22a) being formed with an axial small bore (22a) extending therethrough, and the large diameter bore portion (22b) being formed with an axial large bore (22d) extending therethrough and having at its axial outer end an axially narrowing portion (56);

a second cylindrical member (24) having a radial flange portion (24a) and an axial tubular portion (24c) extending from said radial flange portion (24a), the radial flange portion (24a) being axially slidable within the large diameter bore (22b) of said first cylindrical member (22), the radial flange portion (24a) being provided with a sealing member (29) which seals between said radial flange portion (24a) and said large diameter bore portion (22b) of said first cylindrical member (22), and the axial tubular portion (24c) being formed with a through bore (24b) communicating with said axial small bore (22a¹) of said small diameter bore portion (22a) of said first cylindrical member (22) and provided with a sealing member (30); and

a collet (28) provided within said large diameter bore portion (22b) and having an outer surface (28a) engageable with said axially outwardly narrowing portion (56) of said first cylindrical member (22) and radially constrictible when moving axially within said axially outwardly narrowing portion (56),

the multi-layer hose being merely inserted and firmly fixed between said collet (28) and said axial tubular portion (24c) of said second cylindrical member (24) by means of axial outward movement of said second cylindrical member (24) caused by internal fluid

pressurisation of the hose fitting and also by means of axial outward movement of said collet (28) caused by said axial outward movement of said second cylindrical member (24)."

Dependent claims 2, 3, 6, 7 and 9 relate to preferred embodiments of the fitting according to claim 1 and dependent claim 5 relates to a preferred embodiment of the fitting according to claim 4.

- IV. A notice of appeal against this decision was filed on 11 September 1996 and the fee for appeal paid one day later. The statement of grounds of appeal was filed on 18 November 1996.

In the statement of grounds of appeal reference was made to a further prior art document, viz.

(D13)US-A-4 229 029

In addition to their substantive arguments as to inventive step and sufficiency of disclosure the appellants also objected under Article 123(3) EPC to claim 1 as had been agreed by the Opposition Division, insofar as the collet was now designated as being radially "contractible" whereas in granted claim 1 the corresponding designation was radially "constrictible".

- V. On 17 August 1998 the respondent (proprietors of the patent) filed a new claim 1 to replace that agreed by the Opposition Division, the sole difference being that the term "contractible" had been replaced by "constrictible".

- VI. Oral proceedings before the Board were held on

17 September 1998.

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

The respondents requested that the patent be maintained in amended form on the basis of claim 1 filed on 17 August 1998, claims 2 to 9 and the description as agreed by the first instance and the drawings as granted (main request). In the alternative they requested maintenance of the patent in amended form on the basis of a set of claims 1 to 9 submitted at the oral proceedings (first auxiliary request) or on the basis of claims 1 to 7 and 9 of the main request (second auxiliary request).

In comparison with the independent claims of the main request those of the first auxiliary request had been amended by deleting the word "portion" from the references to a "radial flange portion" and adding that the sealing members seals between "the radial extremity" of the radial flange and the large diameter bore portion.

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

The closest state of the art with respect to the subject-matter of independent claims 1 and 4 was the embodiment of hose fitting shown in Figures 14 and 15 of document D1. This hose fitting was of the same general overall structure as that claimed and operated in the same way, allowing the hose end merely to be inserted between the collet and the tubular portion of

the second cylindrical member with the subsequent pressurization of the hose acting to compress the hose end between these parts to form a fluid-tight joint.

The only distinctions between the subject-matter of claims 1 and 4 and this prior art were trivial design options of no technical effect and which were freely available to the person skilled in the art. In this context the respondents had placed much reliance in the opposition proceedings on the feature added to the claims as granted that the radial flange portion of the second cylindrical member was provided with a sealing member which sealed between the said radial flange portion and the large diameter bore portion of the first cylindrical portion. On closer analysis it was however apparent that this feature was also disclosed in document D1. This followed from the fact that both of the terms "radial flange portion" and "large diameter bore portion" were very broad in ambit. In particular, the "radial flange portion" of the fitting of Figures 14 and 15 of document D1 comprised not just the radial flange (boss, 5b) but the adjoining tubular extension (ferrule 5c) of the second cylindrical member (bush 5); the "large diameter bore portion" of the first cylindrical member (body/housing 1, 7) comprised all parts of the bore in the member which were of greater diameter than the smallest diameter bore portion (bore 1e). On this basis it was evident that the "radial flange portion" was provided with a seal (O-ring 3) which sealed between the "radial flange portion" and the "large diameter bore portion", namely the bore 1a in which the O-ring 3 was held.

As a consequence of the above only two features remained to distinguish the subject-matter of claim 1

from the closest state of the art. These were that the first cylindrical member was "one-piece" and that a stop member was received in the large diameter bore portion to limit axial movement of the sleeve and collet. In the embodiment of Figures 14 and 15 of document D1 the first cylindrical member comprised two body/housing parts engaged by a threaded coupling and the stop for the sleeve and collet was defined by a shoulder on the end of the housing rather than by a separate stop member. Document D1 however itself also disclosed in Figure 4 a very similar type of hose fitting with a one-piece body and a separate stop member for the sleeve, the latter following more or less as a natural consequence of having a one-piece body, in order to allow assembly of the fitting. In any case, one-piece hose and pipe fitting housing members were general well known in the art, as could be seen from the documents D2, D3 and D8. Accordingly, it would be an obvious modification and simplification of the embodiment of hose fitting shown in Figures 14 and 15 of document D1 to replace the two-part housing disclosed there by a one-part housing with a separate stop member.

As for the subject-matter of independent claim 4 here the relative axial positions of the collet and sleeve had been reversed but in all other respects the overall structure and manner of operation of the hose fitting was the same as in claim 1 and the closest state of the art discussed above. This reversal of the axial positions, with the sleeve being axially movable and the collet being fixed, was not indicated as bringing any technical advantages over what was known and could not justify an inventive step.

Even if it were not accepted that document D1 disclosed in Figures 14 and 15 a hose fitting where, for the reasons explained above, the "radial flange portion" of the second cylindrical member should be considered as being sealed against the "large diameter bore portion" of the first cylindrical member then it was in any case an obvious step for the person skilled in the art to adopt measures to this effect in the known hose fitting in order to ensure that the fluid pressure within the fitting provided a sufficient clamping force on the hose end via the second cylindrical member. Here the documents D3, D12 and D13 were of particular reference since they all showed the formation of an equivalent inner cylindrical member of a hose fitting as a differential piston which was acted on by fluid pressure in the same manner as in the claimed invention to give a secure and fluid-tight clamping of the hose end.

Turning to independent claim 8, the patent specification did not sufficiently disclose how the corresponding hose fitting shown in Figure 7 could be manufactured. In particular, in view of the inwardly tapering end portion of the first (outer) cylindrical member it would not be possible to assemble the second (inner) cylindrical member and the collet within it. The respondents had argued that the tapering end portion was formed after assembly but the patent specification was silent on this and contained no information as to how the tapering operation should be performed to produce a workable embodiment.

As for the inventive step of the subject-matter of claim 8 the closest state of the art was represented by document D13. This clearly disclosed a hose fitting in

which the second cylindrical member was formed as a differential piston which was moved axially by internal fluid pressure to effect clamping of the hose end between a set of jaws and the tubular portion of the second cylindrical member. This set of jaws was the mechanical equivalent of a collet and the person skilled in the art would recognise that the two were interchangeable with each other without any difficulty or alteration of function. Thus the only real difference between the subject-matter of claim 8 and the state of the art according to document D13 was that the first cylindrical member as claimed was "one-piece". In this respect analogous arguments applied to those advanced against claims 1 and 4. The respondents could not fairly argue on the one hand that a modified version of the hose fitting of document D13 with a one-piece outer cylindrical member could not be assembled and on the other hand that the means for making the corresponding embodiment of Figure 7 of their patent specification were common general knowledge and freely available to the person skilled in the art.

VIII. The respondents replied substantially as follows:

When the terms "radial flange portion" and "large diameter bore portion" were given their proper natural meaning in the context of the patent specification then it was plainly evident that in the hose fitting of Figures 14 and 15 of document D1 there was no sealing member provided between these portions. The attempt of the appellants to demonstrate otherwise was a mere play on words, divorced from technical reality. In any event there was no clear disclosure in document D1 of the inner cylindrical member being formed to act as a differential piston to give secure automatic clamping

of the end of the hose when fluid pressure was applied to its interior. Instead, this prior art hose fitting was actuated either by manually pulling the hose after insertion into the fitting or by an equivalent movement of the hose resulting from the application of fluid pressure. It was indeed true that document D13 disclosed a hose fitting having an inner cylindrical member formed as a differential piston. This however acted merely to increase clamping of the hose end in response to fluid pressure once the hose fitting had been assembled and the hose fitting was not of the self-actuating type claimed. There was therefore no incentive for the person skilled in the art to incorporate features from document D13 into the hose fitting of Figures 14 and 15 of document D1. Thus the subject-matter of claims 1 and 4 could not be derived in an obvious manner from the state of the art.

The same was true of the subject-matter of claim 8 since apart from anything else it was evidently unworkable to convert the three-piece first cylindrical member of document D13 into a one-piece member as this would make it impossible to assemble the hose fitting on the hose end.

Given the essentially simple nature of the subject-matter of the patent specification the objection of the appellants to lack of sufficiency with respect to the embodiment of hose fitting shown in Figure 7 and covered by claim 8 was clearly unfounded. The person skilled in the art would have no difficulty in choosing a suitable metal working operation to form the tapering portion on the end of the first cylindrical member once the parts of the hose fitting had been assembled.

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 123(2) and (3) (main request)*

In comparison with the equivalent granted claims 1, 4 and 8 the respective independent claims under consideration have been restricted by the addition of the feature that the sealing member "seals between said radial flange portion and said large diameter bore portion". This feature finds a clear basis in the Figures and particular description of the original application, see for example page 14, lines 7 to 11.

The objection of the appellants under Article 123(3) EPC against claim 1 as agreed by the Opposition Division has been removed by the filing of a new claim in which the potentially offending word "contractible" has been replaced by that word found in the granted claim, namely "constrictible".

The amendments made to the description are merely of an editorial nature, to bring this into line with the terms of the amended claims.

Accordingly, the documents according to the main request of the respondents meet the requirements of Articles 123(2) and (3) EPC.

3. *Claims 1 and 4 (main request), novelty and inventive*

step

When document D13 was first submitted with the statement of grounds of appeal the appellants were clearly of the opinion that this represented the closest state of the art with respect to all of the independent claims and went so far as to call the novelty of the subject-matter of claims 1 and 8 into question with respect to it.

Their position on this has now changed with respect to claims 1 and 4 and at the oral proceedings before the Board they fell back in this regard on the main citation from the opposition proceedings, document D1, against which lack of novelty was not alleged. Figures 14 and 15 of this document, particularly relied upon by the appellants, correspond to Figures 1 and 2 of FR-A-2 398 958 which is mentioned (erroneously with the last digits reading "598") in the patent specification as representing the closest state of the art.

The hose fitting disclosed in Figures 14 and 15 of document D1 has a first (outer) cylindrical member comprising a body part and a housing part joined together by a threaded coupling. (The term "cylindrical" is used somewhat loosely in the patent specification rather than in its strict mathematical sense; its evident intended meaning is that the elements involved have a circular cross-section.) The body part has a small diameter bore and the housing part a large diameter bore. Within the large diameter bore there are arranged a collet and a rotatable sleeve, the latter having a shoulder which engages a radially inwardly projecting shoulder at the end of the

housing part to locate the sleeve axially. The collet has an outwardly facing inclined surface which engages an inwardly facing inclined surface on the sleeve. The second (inner) cylindrical member of the known hose fitting is substantially tubular with a radially outwardly extending flange arranged in its central region. The tubular portion to one side of the flange fits within the small diameter bore in the body part and is sealed thereagainst by means of an O-ring housed in a groove in the bore. The tubular portion of the second cylindrical member to the other side of the flange has outwardly facing saw-like teeth which are arranged radially inwardly of corresponding teeth on the inner surface of the collet. The end of a hose which is to be connected to the fitting is inserted between the two sets of teeth and is sealed against the outside of the tubular portion of the second cylindrical member by means of an O-ring disposed in a groove therein. The outer edge of the flange has a hexagonal profile which engages in a correspondingly formed recess in the body part to lock the second cylindrical member against rotation as the hose end is being forced by means of alternate rotation and axial pushing into the fitting.

In the Board's opinion, document D1 does not contain, with respect to the embodiment of Figures 14 and 15, any clear and unambiguous statement as to how locking of the hose end is effected once the fitting is assembled. What is said in the paragraph bridging pages 5 and 6 is that the collet is driven by the hose along the inclined surface of the sleeve and is thereby tightened onto the hose end which is securely clamped between the two sets of teeth. However, what is not

said is how the hose itself is moved. Of course, one possibility is direct manual pulling on the hose as is mentioned in general terms elsewhere in document D1, eg at page 6, lines 86 to 89. On the other hand this direct pulling on the hose could not explain how, as can be seen from a comparison of Figures 14 and 15, which show the fitting before and after locking, the second cylindrical member has moved on locking further into the end of the hose, the extremity of which rides up a curved surface of the flange provided for this purpose, see page 5, lines 104 to 108. Here, however, reference can be had to the description of the embodiment of Figures 16 and 17 where it is said at page 6, lines 53 to 62, that the locking operation can be effected manually by acting on the tubular portion of the second cylindrical member disposed within the small diameter bore of the body part. That method of effecting locking is also evidently applicable to the embodiment of Figures 14 and 15 and could lead without any difficulty to the end locked position shown in Figure 15. What cannot be found in document D1 is any indication, either in the description or drawings, that the second cylindrical member of the embodiment of Figures 14 and 15 is formed as a differential piston which generates an axial force on fluid pressurization of the hose in order to effect locking of the hose fitting. The Board has taken into consideration that independent claim 17 of document D1 and the equivalent passage of the description at page 2, lines 90 to 96, do refer to movement of the second cylindrical member on pressurization of the hose to effect locking of the latter. These general statements correspond to the specific statement on page 3, at lines 83 to 90, concerning the way the second cylindrical member of the embodiment of Figure 1 acts as a piston to effect

locking. Given, however, the number of distinctly different embodiments contained in document D1 it would not be proper to infer that all of them are intended to function as set out in one of the independent claims, especially when the particular description of those embodiments is inconsistent with this assumption or at the least gives no clue in this direction.

Thus, despite the similarities in the overall structure between the hose fittings claimed and that shown in Figures 14 and 15 of document D1 (inner and outer cylindrical members with cooperating sleeve and collet disposed therebetween), the Board is not convinced that this prior art hose fitting is adapted to give automatic fixing of the hose on pressurization in the way set out in the respective penultimate subparagraphs of claims 1 and 4.

In the light of these considerations the technical problem which the claimed invention sets out to solve is to provide a hose fitting of simple construction wherein all that is required for reliable connection of the hose is that it be inserted into the hose fitting and the latter pressurized. The essence of the claimed solution to this problem lies in providing the radial flange portion of the second cylindrical member with a sealing member which seals against the large diameter bore portion of the first cylindrical member. This gives the second cylindrical member a significant differential piston surface area so that on pressurization of the hose fitting an axial force is generated on the member which moves the collet and the sleeve one against the other to constrict the collet onto the end of the hose. This feature is common to the hose fittings of claims 1 and 4, as is the requirement

that the first cylindrical member is one-piece.

Now, it is an important aspect of the arguments developed by the appellants against the subject-matter of claims 1 and 4 that the wording of these claims with respect to the sealing of the radial flange portion of the second cylindrical member against the large diameter bore portion of the first cylindrical member does not in fact provide any distinction over the closest state of the art. In coming to this conclusion they argue that the "radial flange portion" of the second cylindrical member of the hose fitting shown in Figures 14 and 15 of document D1 comprises not just the radial flange itself but also the tubular portion of the member extending into the small diameter bore portion of the body part - the basis for this being seen in the broadening effect of the term "portion" - and "that the large diameter bore portion" of the first cylindrical member comprises all regions of the passage through that member of larger diameter than the small diameter bore mentioned above, ie also the groove in that small diameter bore which houses the O-ring which seals against the tubular portion of the second cylindrical member extending therethrough.

Here, the Board shares the view of the respondents that the arguments of the appellants have stretched the natural meaning of the terms of the claims beyond their breaking point, particularly as these terms must be understood in the light of the description and especially the technical problem to be solved. Although it is true, as can be seen from some of the embodiments of the invention claimed in claim 1, that the "large diameter bore portion" of the first cylindrical member may include sections of slightly increased diameter to

provide a seat for the sleeve and the stop member for the sleeve, it is apparent that the intention is to provide the highest possible sealing diameter for the radial flange in order to generate a high clamping force when the hose fitting is pressurized. In these circumstances it can hardly be apposite to consider a part of the second cylindrical member which is of substantially the same diameter as the tubular portion thereof inserted into the hose end as belonging to the "radial flange portion" of the member or a part of the overall passage through the first cylindrical member which is only larger than the small diameter bore to the extent necessary to house an O-ring as belonging to the "large diameter bore portion" of that member.

As a consequence of the above the next question which needs to be addressed is whether it was obvious for the person skilled in the art to modify the hose fitting disclosed in Figures 14 and 15 in a manner necessary to bring this within the scope of the claims under consideration.

Having regard to the fact that document D1 itself, albeit with respect to a different embodiment, suggests a self-actuating locking of the hose end on pressurization of the hose fitting it would not appear to go beyond the normal competence of the person skilled in the art to consider how this might be achieved in the embodiment of Figures 14 and 15. Here, nothing would appear to stand in the way of increasing the diameter of the small diameter bore in the body part and of the tubular portion of the second cylindrical member which is sealed against this bore. However, the provision of the radial flange with a sealing member which seals against the large diameter

bore in the housing part embodies a conceptual redesign of the hose fitting which goes far beyond routine considerations. In this context it is important to note that the purpose of the six-sided radial flange in the prior art is to lock the second cylindrical member against rotation by engagement with a correspondingly shaped recess in the first cylindrical member and that this feature is an essential element of the teaching of document D1. Nor is there anything in the other state of the art documents relied upon by the appellants in this regard which could encourage the person skilled in the art to embark on such a fundamental change. In particular, the hose fittings of documents D2 and D8 are not of the self-actuating type; document D3 relates to a pipe coupling for malleable metal pipes where various component parts are assembled on the end of the pipe before this is inserted into a casing, there being no second cylindrical member with a sealed radial flange portion equivalent to that claimed; document D12 does indeed relate to a self-actuating hose fitting but this does not comprise a cooperating collet and sleeve arrangement disposed within the large diameter bore portion of the first cylindrical member against which the radial flange portion of the second cylindrical member is sealed; and lastly document D13, as will be explained more fully in the section dealing with claim 8 below, does not in the opinion of the Board function as a self-actuating hose fitting in the manner defined in the claims under consideration here.

Accordingly, the Board has come to the conclusion that the subject-matter of independent claims 1 and 4 cannot be derived in an obvious manner from the state of the art and therefore involves an inventive step (Article 56 EPC). In these circumstances there is no

need to consider whether the provision of a one-piece first cylindrical member with a separate stop member for the sleeve (claim 1) or the provision of a one-piece first cylindrical member with a movable sleeve, fixed collet and stop member for the collet (claim 4) in themselves make an independent contribution to inventive step.

4. *Claim 8 (main request), sufficiency of disclosure, novelty and inventive step*

In comparison with the hose fitting defined in claim 1 that of claim 8 has been simplified by the replacement of the sleeve located within the first cylindrical member by an axially narrowing outer end portion of the member itself. A corresponding embodiment of hose fitting is shown in Figure 7 of the patent specification. Although no information is given in the patent specification as to how that hose fitting should be assembled, it will be wholly apparent to the person skilled in art that this can readily be achieved by first placing the second cylindrical member and the collet within the large diameter bore of the first cylindrical member before the axially narrowing end portion of the latter is formed by an appropriate metal working operation, such as swaging. The use of this well known technique to deform the cylindrical outer member of a hose fitting to entrap a collet is shown for example in GB-A-2 172 073 (document D9). It belongs to the established case law of the Boards of Appeal (see for example T 206/83, OJ EPO 1987, 5, see point 4) that the disclosure of a patent specification is directed to the person skilled in the art and that he may use his common general knowledge, in the present case the possibility of inwardly tapering the end of a cylindrical member by for example swaging, to supplement the information contained in the specification.

The objection of the appellants to insufficiency of disclosure under Article 100(b) EPC against the subject-matter of claim 8 therefore fails.

As for the inventive step of the subject-matter of this claim, novelty no longer being in dispute, the appellants relied upon document D13 as disclosing the closest state of the art. In contrast to the hose fitting of Figures 14 and 15 of document D1, discussed in detail above, the second cylindrical member of the hose fitting of document D13 is certainly disclosed as comprising a differential piston which is acted upon by the pressure within the hose fitting to force a loose set of jaws (generally equivalent in this respect to the collet claimed) against a tapered collar and thus into engagement with the outside of the end of the hose, inside which is inserted a tubular portion of the second cylindrical member. Thus in the view of the appellants the only significant difference between the subject-matter of claim 8 and this prior art is that in the latter comprises three components, namely a tapered collar and two body parts between which a flange at the wide end of the collar is rotatably clamped. In their opinion unification of these three components would be an obvious measure for the person skilled in the art who wished to simply manufacture.

However, the Board is not satisfied that the above assessment of the prior art is an accurate reflection of the distinctions between it and the subject-matter of claim 8. In particular, the Board is not convinced, on the basis of the totality of the prior art disclosure, that the known hose fitting is fully self-actuating in the sense of the invention, requiring simply the insertion of the hose end into the fitting and the application of fluid pressure thereto. In particular, although there is explicit reference in document D13 to the fluid pressure exerting a clamping forcing on the hose end, it would appear that what is

being spoken about here is a further self-tightening effect occurring once the hose fitting has been fully assembled and tightened to lock the hose end. The main reason for coming to this conclusion is the fact that it would not appear possible from the point of view of the available space to introduce the hose end between the tubular portion of the second cylindrical member and the loose set of jaws to the position shown in Figures 1 if the parts of the hose fitting are fully pre-assembled. This would suggest that it is therefore necessary to arrange the tapered collar, jaws, second cylindrical member and one body part on the end of the hose and then to clamp this assembly to the other body part thereby to effect locking of the hose end. That interpretation would be fully consistent with what is shown in Figure 1 where the hose end appears to be properly locked in position without there have been an axial movement of the second cylindrical member under fluid pressure.

Accordingly, the Board is forced to the conclusion that not only is the mode of operation of the hose fitting disclosed in document D13 different to that of claim 8 but that the significant difference in structure conceded by the appellants, namely an outer cylindrical member comprised of a plurality of separate components, is an essential requirement for allowing the hose fitting to be assembled to the end of the hose. Thus the Board cannot see how it could have been obvious for the person skilled in the art to have sought to change the prior art in this respect. In summary, the Board is therefore of the opinion that the subject-matter of claim 8 also involves an inventive step.

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:

Claims: 1 submitted on 17 August 1998;
2 to 9 as agreed by the first instance;

Description: as agreed by the first instance;

Drawings: as granted.

The Registrar:

The Chairman:

N. Maslin

F. Gumbel