

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen

D E C I S I O N
of 12 October 1999

Case Number: T 0232/98 - 3.2.1

Application Number: 93111275.9

Publication Number: 0623776

IPC: F16L 11/08

Language of the proceedings: EN

Title of invention:

Mesh, network hose

Patentee:

Fitt S.p.A.

Opponent:

Lirsa S.r.l.
Lynddahl Plast A/S
Industrias Neoplast, S.A.

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56

Keyword:

"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:

-

Headnote/Catchword:

T 0288/90



Europäisches
Patentamt

European
Patent Office

Office européen
des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number: T 0232/98 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 12 October 1999

Appellant:
(Opponent 02)

Lynddahl Plast A/S
Industrivej 13
6760 Ribe
DANEMARK

Representative:

Brock-Nannestad, George
K. Skott-Jensen
Patentingeniorer A/S
Lemmingvej 225
8361 Hasselager
DANEMARK

Intervenor:

Industrias Neoplast, S.A.
Avda. Fonollar, 22
08830 Sant Boi De Llobregat-Barcelona
ESPAGNE

Representative:

Del Santo Abril
Natividad
Oficina Garcia Cabrerizo, S.L.
Vitruvio 23
28006 Madrid
ESPAGNE

Respondent:
(Proprietor of the patent)

Fitt S.p.A.
Via Piave 4
36066 Sandrigo (Vicenza)
ITALIE

Representative:

Wagner, Karl H., Dipl.-Ing.
Gewürzmühlstrasse 5

80538 München
ALLEMAGNE

- 2 -

Other party:
(Opponent 01)

Lirsa S.r.l.
Via Genio Militare 40
80044 Ottaviano (Napoli)
ITALIE

Representative:

Giugni, Valter
Propria
Protezione Proprietà Industriale S.r.l.
Via Mazzini 13
33170 Pordenone
ITALIE

Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted 8 January 1998
rejecting the oppositions filed against European
patent No. 0 623 776 pursuant to Article 102(2)
EPC.**

Composition of the Board:

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

Summary of Facts and Submissions

- I. European patent No. 0 623 776 was granted on 14 February 1996 on the basis of European patent application No. 93 111 275.9 dated 14 July 1993, with priority being claimed from Italian patent application No. VI 93A000078 dated 13 May 1993.

Claim 1 of the granted patent reads as follows:

"A hose (10), from the interior to the exterior, comprising:

at least one tubular inner layer (3) of plastic or rubber material having an exterior surface;
a chain-type mesh-network (4) having mesh lines (5) and mesh rows (6), said chain-type mesh-network having in a single layer a tubular shape and being wound on the exterior surface of said inner layer, and
an external layer (7) being disposed over the chain-type mesh-network for the protection thereof,
characterized in that said mesh rows and mesh lines are slanted in opposite directions at substantially the same inclination relative to the longitudinal axis of the hose for eliminating torsion effects resulting from pressure changes within the hose."

Dependent claims 2 and 3 relate to preferred embodiments of the hose according to claim 1.

2. The granted patent was opposed by the present appellants (opponents 02) and the other party to the proceedings pursuant to Article 107 EPC (opponents 01). They requested that the patent be revoked in its entirety on the grounds that its subject-matter lacked novelty and/or inventive step (Article 100(a) EPC).

Of the extensive state of the art relied upon in the course of the opposition proceedings only the following prepublished documents have played any significant role on appeal:

(D2) US-A-2 364 560

(D8) US-A-3 760 606

(D9) US-A-3 253 618

- III. With its decision posted on 8 January 1998 the Opposition Division rejected the oppositions.

An appeal against this decision was filed on 9 March 1998, the appeal fee having been paid previously on 3 March 1998. The statement of grounds of appeal was filed on 15 May 1998. The appellants requested that the decision under appeal be set aside and the patent revoked in its entirety.

In the statement of grounds the appellants referred to two further state of the art documents, viz

(D26) US-A-2 201 905

(D27) US-A-2 788 804.

IV. On 14 April 1999 an intervention under Article 105 EPC was received from the company Industrias Neoplast, S.A. (henceforth the intervenors). With their notice of intervention the intervenors filed a copy of the notification of the Court of First Instance of Barcelona dated 15 January 1999 that proceedings for infringement of the equivalent Spanish patent had been instituted against them. The intervenors requested that the patent be revoked in its entirety. In support of this request they argued in essence that the subject-matter of the patent lacked novelty with respect to Italian patent application No. VI 93A000077 (D5) or in the alternative inventive step with respect to document D8 and the common general knowledge of the person skilled in the art.

V. Oral proceedings before the Board were held on 12 October 1999.

Opponents 01, who had taken no active part in the appeal proceedings, and the intervenors did not appear, despite being duly summoned. In accordance with Rule 71(2) EPC the oral proceedings were continued without them.

VI. In support of their request for revocation of the patent the appellants argued substantially as follows:

Document D8 disclosed a circular knitting machine specially designed and operated to apply a knitted tubular reinforcement layer to the inner layer of a hose in such a way that the resulting hose would not be prone to twisting in use. An inherent characteristic of the knitted tubular layer produced by the machine of

document D8 is that its courses and wales ("mesh lines" and "mesh rows" in the terminology of present claim 1) slant in opposite directions. That this was the case could readily be seen from a video presented at the oral proceedings and a working model demonstrated there of a machine constructed in accordance with the principles set out in document D8. The actual orientation of the courses and wales, which in practice would always be at right-angles to each other, would depend in particular on the number of needle feeds used. With a machine having six or eight needle feeds, which is what the person skilled in the art would implicitly understand on reading document D8, the resulting courses and wales would automatically come to lie at substantially the same, but respectively opposite, inclination with respect to the longitudinal axis of the hose, as required by present claim 1. Furthermore, it was also implicit to the person skilled in the art that the product issuing from the machine shown in document D8 would in addition be provided with an outer protection layer, since this was always the case with the type of hose being discussed. Consequently, the subject-matter of present claim 1 lacked novelty with respect to the inherent and implicit disclosure of document D8.

If the above argument concerning the same inclinations of the courses and wales could not be accepted then it was at the very least obvious for the person skilled in the art to adopt this measure in order to solve the technical problem addressed in the patent of twisting of the hose under pressure. That this was the case could be seen from document D2 where the technically equivalent problem of resisting opening of the meshes

of a knitted tubular covering layer on twisting of a cable was solved by knitting the cover so as to have courses and wales extending in respectively opposite inclinations of 45° to the longitudinal axis of the cable.

- VII. The respondents requested that the appeal be dismissed and that the decision of the Opposition Division to maintain the patent in unamended form confirmed. In support of this request they argued substantially as follows:

The appellants case relied upon various assumptions about the inherent or implicit disclosure of document D8, none of which was based on fact. In particular, the appellants had assumed for the purposes of their arguments and demonstrations that the inner hose layer being fed through the machine of document D8 was rotated in the same manner as the sleeve. Nothing about this was however said in the document itself and the only basis for the appellants' assumption in this respect were the symbolic rotational arrows to be seen in Figure 2. What those arrows were intended to represent was however not unambiguously clear. If, contrary to the assumption of the appellants, the inner hose layer did not rotate then the mesh rows of the knitted reinforcement layer would still extend along the axis of the hose and not be slanted thereto as required by the invention. This could be clearly seen from the video presentation which the respondents had prepared. Furthermore, the arguments of the appellants that the person skilled in the art would implicitly understand the machine of document D8 to be of a type which would give mesh lines and mesh rows slanted at

substantially equal and opposite angles to the axis of the hose were even further removed from reality and based wholly on hindsight knowledge of the invention. Lastly in this respect it had to be disputed that all hoses of the relevant type were provided with an external layer over the knitted reinforcement layer; this was for example not the case with fire hoses.

Document D2, also particularly relied upon by the appellants, had nothing at all to do with the technical problem addressed by the present patent and would not be taken into account by the person skilled in the art attempting to solve this problem.

The admissibility of the intervention was no longer challenged. Since the intervenors, with respect to the issue of inventive step, relied essentially upon the same state of the art and similar arguments as those put forward by the appellants, no further comments were necessary in this context.

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. The intervention is also admissible.

The reasoned notice of intervention was filed, and the requisite opposition fee paid, within three months of the institution of infringement proceedings against the intervenors, that latter date, according to Spanish

law, which is determinative (see "Singer: The European Patent Convention", edited by R. Lunzer, paragraph 105.3), being the date on which the intervenors were notified to this effect by the relevant court.

3. *Novelty*

The intervenors allege that the subject-matter of claim 1 lacks novelty with respect to document D5, which is an Italian patent application of the same date as the Italian patent application from which priority is validly claimed for the present patent. The publication date of document D5 is not known to the Board but in the circumstances it is apparent that this date cannot be earlier than the priority date claimed. Thus document D5 does not belong to the state of the art according to Article 54(2) EPC and the arguments of the intervenors in this respect do not need to be considered any further.

4. The true explicit and implicit disclosure of document D8 has been the subject of keen debate between the parties in several respects. The issues in contention cover both the construction of the circular knitting machine disclosed there and what is intended to be achieved with it and how.

The uncontentious aspects of the disclosed machine can be summarised as follows: Instead of knitting the tubular reinforcement layer directly onto the inner layer of the hose, as was done in the prior art, this layer is knitted onto a tapered rotating sleeve from which it is transferred to the inner layer of the hose.

This sleeve is rotated at the same RPM as the cam ring which drives the knitting needles, but in the opposite direction thereto. This is stated to "neutralize the torque which was imparted to the hose by the unidirectional spiralling of the courses", cf column 2, lines 7 to 9.

Now, the appellants argue that it is clear for the person skilled in the art from Figure 2 of document D8 that the inner layer of the hose is also rotating with the sleeve as it is passed therethrough to pick up the knitted reinforcement layer. This follows in their view from the fact that in the Figure both the sleeve and the hose itself are associated with respective symbolic rotational arrows illustrating that they rotate in the same direction. The respondents on the other hand point to the fact that no mention of the rotation of the hose is made in the document and no means are disclosed for imparting the necessary rotation to the inner layer of the hose as it fed to the sleeve or for taking up the rotating hose with its reinforcement layer once this has been applied thereto. Furthermore, the knitting machine involved was stated to be of the basic type as disclosed in US-A-3 543 280 or document D26, in neither of which was there any mention of knitting a reinforcement layer onto a rotating hose inner layer. In lines 49 to 51 of column 1 of document D8 it was simply said that the hose to be covered "is drawn upwardly through the machine past the knitting line to receive the knit covering."

The presence of rotation of the hose in the machine of document D8 is crucial to the arguments of the appellants since without it, as successfully

demonstrated by the respondents' experiments recorded on video and shown at the oral proceedings, the mesh lines (wales) of the knitted reinforcement layer extend along the axis of the hose. This aspect of the respondent's evidence went unchallenged. For the purposes of the present case the Board is however prepared to leave the issue undecided. The reason for this is that even on the assumption that the appellants' interpretation is correct and that the hose being provided with the knitted reinforcement layer rotates with the sleeve with the effect (again adequately demonstrated by their experiments and not challenged as such by the respondents) that the mesh lines (wales) and mesh rows (courses) of the knitted layer slant in opposite inclinations with respect to the axis of the hose, then the subject-matter of claim 1 is nevertheless novel and non-obvious, as will be explained in greater detail below.

A second area of contention lies in the question of what the intended ultimate purpose of using the circular knitting machine of document D8 to reinforce a hose is supposed to be. The document itself simply says in lines 16 to 18 of column 1 that this purpose is to produce an adequately reinforced hose which, when unrestrained, will lie flat and relaxed. As explained previously in lines 12 to 14 of the same column the unidirectional knitting of the reinforcing layer in the prior art imparts a torque which causes the reinforced hose to twist and warp. In the opinion of the appellants these references can only be sensibly understood in the context of a hose when in use and under pressure, in other words in direct correlation with what is stated in the present patent specification

to be the technical problem underlying the claimed invention, namely eliminating twisting of the hose as its dimensions change under pressure. However, the Board can see no justification for the gloss put on the teaching of document D8 by the appellants and sees no reason why that teaching should not be accepted at face value. In particular, it would appear very difficult to reconcile the reference in the document to the unrestrained hose lying flat and relaxed with it being under pressure. Furthermore, it must also be noted that document D8 does not in itself directly associate the result it sets out to achieve to an arrangement in which the mesh lines and mesh rows of the knitted reinforcement layer are inclined in respective opposite directions, but instead makes this association with the fact that knitting the reinforcement layer onto a tapered rotating sleeve dissipates or neutralises the torque which would otherwise be applied to the hose, see column 2, lines 20 to 26.

As far as the question of novelty is concerned the purpose for which a knitted reinforcement layer with oppositely inclined mesh lines and mesh rows is applied or whether indeed this structure is merely the fortuitous result of a measure adopted for a different end, does not play a role. This will only become of significance when the question of inventive step is investigated.

What is however of great relevance to the question of novelty is the fact that present claim 1 does not merely require the mesh lines and mesh rows to be inclined in opposite directions with respect to the axis of the hose but for them to be at substantially

the same inclination to this axis. The arguments of the appellants that this arrangement of the mesh lines and mesh rows would indeed be the automatic result of putting the teachings of document D8 into practice are tenuous. On the one hand the appellants conceded that the inclination of the mesh lines and mesh rows from the longitudinal axis of the hose is strongly dependent on the number of knitting feeds. A consequence of this was that the hose shown being produced in their video presentation and the hose produced on the working model demonstrated at the oral proceedings, where in both cases only two knitting feeds were present, had mesh lines and mesh rows which were at respective inclinations to the hose axis which differed considerable from each other. On the other hand they argue that the person skilled in the art would implicitly recognise the machine of document D8 as having six or eight knitting feeds and that with this number substantial equality of the two inclinations would be the result. But there is nothing in document D8 which could suggest to the person skilled in the art that it should use a knitting machine with six or eight knitting feeds in order to achieve the desired results. In fact, document D8 refers to the knitting machine being of the basis type disclosed in US-A-3 543 280 or document D26, neither of which would appear to have more than two knitting feeds. Thus, the arguments of the appellants with respect to this essential feature of the characterising clause of claim 1 are unconvincing.

Lastly, the Board is also not convinced by the argument of the appellants that the step of providing an external protective layer over the knitted

reinforcement layer is so well known and wholly conventional that it was also implicitly disclosed in document D8, without being mentioned there. In the first place, as correctly pointed out by the respondents, fire hoses are not provided with such an external layer and it is not to be excluded, see the reference to the hose lying flat when relaxed, that document D8 is concerned with the manufacture of a fire hose. Secondly, and more generally, it is important to distinguish between what might be an obvious measure for the person skilled in the art to complete or perfect the product of the machine disclosed in document D8 and what that document itself unambiguously teaches this product to be. This situation is not equivalent to that dealt with in decision T 288/90 (referred to in section I C 3.1 of "Case law of the Boards of Appeal of the EPO"), relied upon by the appellants in this context, where it is permissible when investigating novelty to refer to the general technical background, as evidenced for example by a further document, in order to come to the correct interpretation of a term of the art in a citation.

For the above reasons the Board has come to the conclusion that the subject-matter of present claim 1 is novel with respect to document D8.

5. *Inventive step*

It will be apparent from what is said above that the issue of inventive step hinges on whether it would have been obvious for the person skilled in the art seeking to deal with the technical problem of reducing the tendency of a hose with a knitted reinforcement layer

to twist or kink when pressure is applied to it to apply the general principles taught by document D8 in such a particular manner that the resulting knitted reinforcement layer has mesh lines and mesh rows which are slanted in opposite directions at substantially the same inclination relative to the longitudinal axis of the hose.

Here, the appellants placed special emphasis on document D2. This document relates to a knitting method, and circular knitting machine for carrying out the method, of applying a covering to a conductor core. In the method the conductor core is rotated as it passes through the knitting machine or alternatively the thread supplies and the needle cylinder are both rotated. Figure 3 shows a conductor having a knitted covering wherein the mesh lines and the mesh rows both extend at substantially 45° to the axis of the conductor, in respectively oppositely directed spirals. The stated purpose of having the mesh lines and mesh rows spiral in opposite directions is that the tendency of the meshes of the knitting to open upon twisting or bending the conductor is reduced to a minimum. The appellants argue that the technical problems addressed in document D2 and by the claimed invention are effectively equivalent. In their opinion the opening up of the meshes on twisting of the covering considered in document D2 would be seen by the person skilled in the art as mirroring the twisting of a hose caused by the increase in diameter of the knitted reinforcement layer. In the view of the Board however that analysis is overly abstract and depends for its conclusion to an unacceptable degree on hindsight knowledge of the presently claimed invention. Thus, although the Board

can readily accept the proposition of the appellants that the relevant skilled person would have a broad knowledge of proposals made in the art of circular knitting machines and accordingly would have been aware in principle of the teachings of document D2, there is nothing in this document that would have encouraged him to adopt a knitted hose reinforcement layer having mesh lines and mesh rows spiralling in opposite directions at substantially equal angles in order to deal with the problem of twisting of the hose under pressure.

6. The intervenors also considered document D8 as constituting the most relevant state of the art for the evaluation of inventive step. In contrast to the appellants they relied however much more on general considerations in their arguments that it was an obvious measure for the person skilled in the art to adopt the structure of knitted reinforcement layer as claimed in order to solve the technical problem addressed in the contested patent. In particular, they drew the comparison between this claimed structure and the well known structure of a braided hose reinforcement layer where the respective sets of filaments also extend spirally in equal and opposite directions around the hose. In the view of the Board this approach overlooks the significant fact that a braided structure is inherently symmetrical whereas a knitted structure is not; it is thus not possible fairly to equate the mesh lines and mesh rows of a knitted structure to the respective filaments of a braided structure.

It is of interest to note in this context that in document D9, which is the only prior art document which

specifically addresses the technical problem of the twisting of a tubular knitted reinforcement layer as this layer changes diameter, the proposed solution is to provide two separate knitted layers with respective mesh lines spiralling in opposite directions and respective mesh rows extending perpendicularly thereto, thus giving a genuinely symmetrical structure.

7. Having regard to the above the Board comes to the conclusion that the subject-matter of granted claim 1 cannot be derived in an obvious manner from the state of the art and therefore involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

S. Fabiani

F. Gumbel