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D E C I S I O N
of 1 August 1996

Case Number: T 0196/95 - 3.2.1

Application Number: 89910340.2

Publication Number: 0428616 (WO 90/01654)

IPC: F16L 11/12, F16L 33/213

Language of the proceedings: EN

Title of invention:
Kink impeding hose for spraying water

Applicant:
Plastic Specialties and Technologies Investments, Inc.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56, 111(1)

Keyword:
"Novelty (no, main request)"
"Inventive step (yes, 3rd auxiliary request)"
"Remittal to Examining Division for further examination"

Decisions cited:
G 0010/93

Catchword:
-



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Boards of Appeal

Chambres de recours

Case Number: T 0196/95 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 1 August 1996

Appellant: Plastic Specialties and Technologies
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Representative: Allen, Oliver John Richard
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Decision under appeal: Decision of the Examining Division of the European
Patent Office posted 11 October 1994 refusing
European patent application No. 89 910 340.2
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: F. Gumbel
Members: S. Crane
G. Davies

Summary of Facts and Submissions

- I. European patent application No. 89 910 340.2 was refused by a decision of the Examining Division taken at oral proceedings on 19 July 1994 and posted on 11 October 1994.
- II. The reason given for the decision was that the subject-matter of claim 1 according to both the main and auxiliary request lacked novelty with respect to the document FR-A-1 380 685 (D2).

During the course of the examination proceedings an objection as to lack of novelty had also been raised with respect to:

D1: US-A-3 720 235

D3: GB-A-766 085

D4: JP-U-62-2390.

Claim 1 according to the main request considered by the Examining Division read as follows:

"A flexible plastic or rubber hose (10) having opposite open ends for the delivery of pressurised water therethrough, one of which ends is connectable to a pressurised water supply and the other of which ends is connectable to a flow restricting device for spraying a pressurised stream of water which creates a back pressure in the water in the hose (10), the hose (10) having a plurality of circumferentially spaced ribs (20, 40) integrally moulded with the inner wall thereof which extend substantially continuously longitudinally between the ends of the hose, the ribs (20, 40) extending inwardly only a short distance from the inner-wall, characterised in that the hose (10) can be bent back on

itself to form a kink, in that, when a kink is formed in the hose (10), the ribs (20, 40) provide an opening for the pressurised water and thus provide the function of water delivery through the hose (10) when kinked and in that the ribs provide the additional functions of resistance to hose kinking and, when a kink is formed, equalization of water pressure on both sides of the kink causing the hose (10) to unkink."

Claim 1 according to an auxiliary request considered by the Examining Division read as follows:

"A flexible plastic or rubber hose (10) having opposite open ends for the delivery of pressurised water therethrough, one of which ends is connectable to a pressurised water supply and the other of which ends is connectable to a flow restricting device for spraying a pressurised stream of water which creates a back pressure in the water in the hose, the hose (10) having a plurality of circumferentially spaced ribs (20, 40) integrally moulded with the inner wall thereof which extend substantially continuously longitudinally between the ends of the hose (10), the ribs (20, 40) extending inwardly only a short distance from the inner-wall, characterised in that the inner diameter, wall thickness and material of the hose (10) is such that the hose can be bent back on itself to form a kink, and in that the number and configuration of the ribs are such that when a kink is formed in the hose, the ribs provide an opening for the pressurised water and thus provide the function of water delivery through the hose when kinked and that the ribs provide the additional functions of resistance to hose kinking and, when a kink is formed, equalization of water pressure on both sides of the kink causing the hose (10) to unkink."

The set of claims according to both the main and auxiliary request included a further independent claim (claim 3) which read as follows:

"A flexible plastic or rubber hose for spraying water having opposite open ends for the delivery of pressurised water therethrough, one of which ends is connectable to a pressurised water supply and the other of which ends is connectable to a flow restricting device for spraying a pressurised stream of water which creates a back pressure in the water in the hose, the hose having plurality of circumferentially spaced ribs integrally moulded with the inner wall which extend substantially continuously longitudinally between the ends of the hose, characterised in that the ribs (20, 40) are adapted to provide a plurality of functions including resistance to hose kinking and, when a kink is formed, water delivery through the hose (10) and equalisation of water pressure on both sides of the kink causing the hose (10) to unkink and in that an annular coupling (52, 82) is connected to each hose end to facilitate the delivery of water under pressure through the hose (10), each coupling (52, 82) having an annular corrugation compressed into the hose wall of the hose, the corrugation being transverse to the longitudinal ribs (20, 40) to provide surface areas of greater and lesser compression for absorbing the ribs (20, 40) into the hose wall (14) and thereby sealing the hose end against pressurised water leakage, the ribs (20, 40) having a size, number and hardness all limited to what the hose wall thickness and softness can absorb for sealing against leakage."

III. An appeal against the decision of the Examining Division was filed on 13 December 1994 and the fee for appeal paid at the same time. The statement of grounds of appeal was filed on 17 February 1995.

The main request of the appellants was that the contested decision be set aside and a patent granted on the basis of the claims according to the main request considered by the Examining Division. In the alternative they requested that the grant be based on the auxiliary request considered by the Examining Division (first auxiliary request) or on the basis of respective claims submitted as second, third and fourth auxiliary requests with the statement of grounds.

Claim 1 of the second auxiliary request corresponds to claim 1 of the first auxiliary request with the added limitation that the ribs occupy up to 10% of the internal volume of the hose. According to claim 1 of the third auxiliary request the ribs occupy between 3% and 5% of the internal volume of the hose. Both of the sets of claims according to the second and third auxiliary request include the further independent claim 3 set out in Section II above. In the set of claims according to the fourth auxiliary request this further independent claim is made the sole independent claim.

They also requested oral proceedings in the event that the Board were to consider refusing the application.

IV. The arguments put forward by the appellants in support of their request were essentially as follows:

The hose disclosed in document D2 was soft and collapsible, enabling it to be rolled up flat. This being the case it was highly unlikely that the hose was "kinkable" in the sense of the claimed invention. Furthermore, the internal ribs were provided in the hose of document D2 for a completely different purpose to that of the claimed invention, namely to facilitate emptying of the hose before being rolled up for stowage. The internal ribs of the claimed invention, on the other

hand, exercised a unique combination of functions. They inherently stiffened the hose to prevent kinking in the first place and if the hose did form a kink maintained flow through the kinked portion. This enabled equalisation of water pressure on both sides of the kink causing the hose to unkink.

In claim 1 of the first auxiliary request the features of the hose which made it kinkable in the first place had been added to provide an even clearer distinction over the state of the art according to document D2. In claim 1 of the second and third auxiliary requests a preferred and a most preferred range respectively for the volume of the ribs in comparison with the internal volume of the hose had been added. By using rib volumes in these ranges it was possible to achieve the desired effects without diminishing the normal flow cross-section inordinately. Claim 1 of the fourth auxiliary request related to a combination of an internally ribbed hose and a coupling of particular form which enabled the achievement of a good seal between the hose and the coupling.

- V. In a communication according to Article 110(2) EPC dated 31 January 1996 the Board expressed its provisional opinion that document D4 was the most relevant of the documents cited against novelty in the examination proceedings. The subject-matter of claim 1 according to both the main and first auxiliary requests lacked novelty with respect to this state of the art, and the subject-matter of claim 1 of the second auxiliary request lacked inventive step. Claim 1 according to the third auxiliary request could however in principle form the basis for the grant of a patent. Since there appeared to be doubts as to whether independent claim 3 of the third auxiliary request related to the same invention as that defined in claim 1 and as to whether

the subject-matter of claim 3 involved an inventive step, the appellants were invited to make the relevant features of claim 3 the subject of a dependent claim. The appellants were also invited to revise the application throughout to adapt it to the terms of claim 1 of the third auxiliary request and to modify the two-part form of this claim.

- VI. In a letter dated 28 June 1996 the appellants expressed their surprise at the position taken by the Board with respect to claim 3 of the third auxiliary request, since this had never been objected to by the Examining Division. In order that they should be afforded the opportunity of arguing any objection before the Examining Division they requested that the application be remitted to the Examining Division for finalisation of the form of claim 1 of the third auxiliary request and for further consideration of claim 3 of that request.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 and Rules 1(1) and 64 EPC. It is therefore admissible.
2. The present application is concerned with a commonplace problem associated with the use of hoses, in particular garden hoses, that of "kinking". This occurs when the hose is subjected to such severe bending or twisting that its wall buckles at one point thus occluding the passage through the hose. The tendency of a hose to kink is related to its diameter, wall thickness and the flexibility of the material from which it is made.

Modern garden hoses are generally thin-walled with the necessary burst strength being given by the incorporation in the wall of a knitted fibre reinforcement layer. As a result of their thin walls these hoses are inherently susceptible to kinking.

In the context of such a hose the present application therefore proposes the provision of longitudinally extending, circumferentially spaced ribs integrally moulded with the inner wall of the hose. The numbers and configuration of these ribs are such that when a kink is formed in the hose, the ribs prevent complete occlusion of the passage through the hose and provide an opening sufficient to maintain delivery of water. As a consequence, the water pressure established on both sides of the kink can cause the hose to unkink. This effect can be particularly enhanced if the nozzle at the delivery end of the hose is closed by the user, thus further increasing the back pressure downstream of the kink.

Document D4 (together with an English translation) was cited by a third party in the course of the examination proceedings. With reference to Figure 1 there is described a flexible hose for conveying water, for example a sprinkler hose, according to the prior art known from document JP-A-56/5173. The hose has longitudinally extending, circumferentially spaced ribs formed on its inner wall. Each of the ribs has a triangular cross-section. The ribs engage with the inside wall of the hose when it is twisted or bent and thereby prevent blockage of the passage through the hose so that fluid flow is maintained. It is apparent from the drawings of document JP-A-56/5173 that the construction of the hose under consideration corresponds to that indicated above, comprising a knitted reinforcement layer, and the Board can see no reason why

this hose should not be "kinkable" in the sense of the claimed invention. It is true that no mention is made in document D4 about the ribs providing additional resistance to kinking of the hose but this effect is inherently present since any, even localised, increase in the wall thickness of the hose will provide increased bending resistance and thus reduce the risk of a kink forming. It is also true that document D4 makes no mention of the effect of water pressure equalisation on both sides of the kink causing the hose to unkink. Again, however, this is inherent in any arrangement which allows flow of water past the kink in the hose.

The Board therefore comes to the conclusion that the subject-matter of claim 1 according to the main request lacks novelty (Articles 52(1) and 54 EPC).

The same conclusion applies to the subject-matter of claim 1 according to the first auxiliary request. In comparison with claim 1 of the main request this merely contains a general indication of the combination features (inner diameter, wall thickness and material) which determines whether the hose can be bent back on itself to form a kink. Since it is apparent that the hose of document D4 must be kinkable, it is self-evident that it must also exhibit this combination of features.

For determining the required relative size of the ribs in comparison with the size of the passage in the hose the person skilled in the art is faced with conflicting design criteria. Increasing the size of the ribs is detrimental to the weight and cost of the hose and reduces the flow of water in normal use. On the other hand the ribs have to be large enough to be effective when the hose becomes kinked. The balancing of advantages and disadvantages of a technical measure of this type belongs to the routine practice of the person

skilled in the art and the Board cannot see that it would involve an inventive step to set a limit of 10% for the volume of the ribs in comparison with the internal volume of the hose, as is required by claim 1 of the second auxiliary request. Thus this request can also not be granted (Article 56 EPC).

The very specific range of 3% to 5% for the volume of the ribs given in claim 1 of the third auxiliary request (this preferred value is to be found in the first paragraph of page 10 of the original application) cannot however be derived in an obvious manner from the general considerations mentioned above. Thus this claim, subject to suitable amendment with respect to its two-part form (Rule 29(1) EPC) and adaptation of the description could in principle form the basis for the grant of a patent.

3. According to decision of the Enlarged Board of Appeal G 10/93 (OJ EPO 1995, 172) a Board of Appeal dealing with an appeal against the refusal of an application by an Examining Division has the power to examine whether the application or the invention to which it relates meets the requirements of the EPC, irrespective of whether those requirements were considered by the Examining Division. Alternatively, the Board may refer the case back to the Examining Division for further examination of these issues. Having regard to what is said in point 5 of the Reasons about the circumstances governing the choice of the alternative courses of action to be taken the present Board has decided that it would be equitable, in accordance with the request of the appellants, to refer the case back to the Examining Division for further examination in particular of the questions whether independent claim 3 of the third auxiliary request relates to the same invention as claim 1 of that request and whether the subject-matter of claim 3 involves an inventive step.

Order

For these reasons it is decided that:

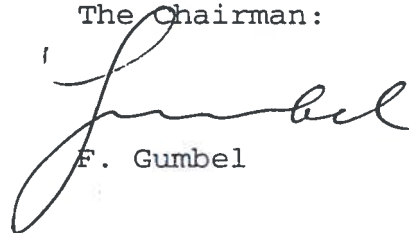
1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution.

The Registrar:



S. Fabiani

The Chairman:



F. Gumbel