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D E C I S I O N
of 25 April 2003

Case Number: T 0700/00 - 3.2.4

Application Number: 93305910.7

Publication Number: 0581570

IPC: A44B 18/00

Language of the proceedings: EN

Title of invention:
Hook-and-loop fastener

Patentee:
YKK CORPORATION

Opponent:
Gottlieb Binder GmbH & Co.

Headword:
-

Relevant legal provisions:
EPC Art. 56
EPC R. 71(2)

Keyword:
"Inventive step - yes"

Decisions cited:
-

Catchword:
-

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Case Number: T 0700/00 - 3.2.4

D E C I S I O N
of the Technical Board of Appeal 3.2.4
of 25 April 2003

Appellant: (Opponent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 18 May 2000 rejecting the opposition filed against European patent No. 0 581 570 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: C. A. J. Andries
Members: M. G. Hatherly
H. Preglau

Summary of Facts and Submissions

I. The opposition division's decision rejecting the opposition against European patent No. 0 581 570 was posted on 18 May 2000.

The appellant (opponent) filed an appeal and paid the appeal fee on 5 July 2000, and filed a statement of grounds on 19 September 2000.

II. Claim 1 as granted reads:

"A hook-and-loop fastener comprising a base web (1), a multiplicity of hook elements (3) and loop elements (2) mounted on the base web (1) in rows and columns, each loop element (2) being 0.1mm to 2.5mm higher than each hook element (3), characterised in that in each row, each hook element (3) has a loop element (2) on each side thereof: the distribution ratio of the hook elements (3) to the total of the hook elements (3) and loop elements (2) being approximately 33 percent; and each hook element (3) being made of thermoplastic monofilament of 400 to 700 denier."

III. The following documents played a role in the appeal proceedings:

D1: JP-U-4-6908 with a translation into English

(in this decision, quotations of text and any page and line numbers are those of the translation)

D2: DE-A-1 685 354

D3: JP-U-2-111 309

D5: EP-B-0 604 869

D6: WO-A-93/12687

IV. Oral proceedings were held on 25 April 2003 in the presence of the appellant. The respondent (patentee) had announced by letter of 25 March 2002 (in fact 2003) that he would not attend the oral proceedings so, in accordance with Rule 71(2) EPC, these took place without him.

During the written and oral parts of the appeal proceedings the appellant argued that it would be obvious to the skilled person to modify the fastener of D1 using his general knowledge and/or the teachings of the prior art, and so to arrive at a fastener as claimed in the present patent.

During the written part of the appeal proceedings the respondent countered the appellant's arguments.

V. The appellant requested that the decision under appeal be set aside and the patent revoked.

The respondent requested that the appeal be dismissed i.e. that the patent be maintained unamended.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty - claim 1*

The board considers that none of the prior art

documents on file discloses all the features of claim 1. Moreover in the oral proceedings before the board the appellant announced that he did not dispute novelty.

The board thus finds the subject-matter of claim 1 novel (Articles 52(1) and 54 EPC).

3. *Closest prior art*

3.1 The board and the parties agree that the closest prior art or starting point for assessing inventive step is the fastener disclosed by D1.

3.2 According to page 3, lines 4 to 13 of D1, "Fig. 1 shows a schematic sectional view of a surface fastener having hook-like engagement elements and loop-like engagement elements in mixture on the same surface of a base web. ... The loop-like engagement elements 3 and the hook-like engagement elements 2 are arranged ... in rows alternately for each row."

Moreover page 1, paragaph 1 of D1 states that the loop elements are 0.1 to 2.0 mm higher than the hook elements.

Still further, lines 28 and 29 of page 4 of D1 state that "the warp of the hook was made of nylon monofilaments of 330D".

3.3 Thus, in the words of the present claim 1, D1 discloses

- a hook-and-loop fastener comprising a base web, a multiplicity of hook elements 2 and loop elements 3 mounted on the base web (1) in rows and columns,

- that each loop element 2 is higher than each hook element by an amount that lies in a range which is within the range specified in the present claim 1,

- that, in the sole row shown in Figure 1, each hook element 2 has a loop element 3 on each side thereof,

- each hook element 2 being made of thermoplastic monofilament.

3.4 The present claim 1 refers to "a distribution ratio of the hook elements (3) to the total of the hook elements (3) and loop elements (2) being approximately 33 percent".

Page 1, line 9 of D1 refers to "the amount of said loop-like engagement elements being in the range of 40 to 60%". Since Figure 1 of D1 is schematic it cannot be used to calculate the distribution ratio (and even if it could, the distribution ratio would not be lower than the 40% just specified).

Since one needs to increase 33 by just over 21% to arrive at 40, the board does not accept that the 40% disclosed by D1 is the same as the claimed "approximately 33 percent".

3.5 The 330 denier for the nylon monofilaments disclosed in lines 28 and 29 of page 4 of D1 (the only mention of denier in D1) lies outside the claimed range of "400 to 700 denier".

3.6 Thus, summarising, the subject-matter of the present claim 1 is disclosed by D1 except at least for the

distribution ratio of approximately 33% and the hook element thickness of 400 to 700 denier.

4. *Problem and solution*

Starting from the hook-and-loop fastener disclosed by D1, the problem to be solved is to improve the fastener e.g. to improve the intermeshing force of two parts or two matching pieces of fastener.

The present invention is based on the recognition that, if there is one hook to every one loop, then, when the fasteners or fastener parts are brought into contact, a hook is often opposite another hook so that neither can engage a loop. Accordingly the fastener of the present invention has substantially more loops than hooks to ensure that, when fasteners or fastener parts are brought into contact, a greater proportion of the hooks engage loops. Since the present fastener has proportionately less hooks, it is flexible and has a good touch feel.

5. *Inventive step - claim 1*

5.1 Lines 1 to 10 of page 1 of D1 explain that a surface fastener whose hooks and loops are the same height suffers from a rough touch feeling, and its hooks, if not engaged with loops, tend undesirably to engage a fabric of a textile product.

The appellant essentially argued that, in order e.g. to improve the touch feeling (comfort) of the D1 fastener, it would be obvious to reduce its distribution ratio from 40% to arrive at the claimed "approximately 33 percent". Since this would result in less hooks, it

would be obvious to increase their unit strength by moving up to the claimed range of "400 to 700 denier".

5.2 The board will first examine whether this would be obvious if the skilled person considered D1 on its own.

5.2.1 In the board's view, the whole document D1 teaches a basic equality of numbers of hooks and loops i.e. the 50% distribution ratio of the sole example of the invention of D1 set out in the paragraph bridging pages 4 and 5. The skilled person realises that he must stay within the range 40% to 60% because he is warned in lines 18 to 20 of page 3 that "If the distribution ratio ... is out of the range mentioned above, the balance with a mating surface fastener becomes worse, thus resulting in a reduced engagement force." Although he is told that there need not be exact equality, in no way does D1 encourage him to reduce the distribution ratio to approximately 33%.

5.2.2 The appellant argued that the distribution ratio is functionally linked to the thickness of the monofilament used for the hooks. He maintained that it is part of the skilled person's general knowledge that if a thicker (i.e. higher denier) monofilament is used for the hooks then the percentage of hooks must be reduced to avoid the fastener scratching the user's skin.

D1 indeed teaches that a good touch feeling can be achieved by having a suitable distribution ratio and by the hooks being lower than the loops (see e.g. the last paragraph of page 2, and page 3, lines 23 to 28). However the only mention of denier in D1 is in lines 28 and 29 of page 4 describing the sole example of the

invention, thus D1 does not seem particularly concerned with the hook denier and certainly does not teach the interdependence of the distribution ratio and the hook denier.

5.2.3 In section 2.3 on pages 4 and 5 of the letter of 16 January 2001, in lines 15 and 16 on page 2 of the letter of 21 March 2001 and during the oral proceedings, the appellant argued that, starting from a fastener disclosed by D1 with a distribution ratio of 40% and hook denier of 330, it would be obvious to decrease the distribution ratio to approximately 33% and to increase the hook denier to between 400 and 700.

The only mention of denier in D1 is in lines 28 and 29 of page 4 describing the sole example of the invention, stating that "the warp of the hook was made of nylon monofilaments of 330D". Lines 1 and 2 of page 5 make it clear that in the sole example of the invention the distribution ratio is 50% (not 40%).

If the appellant's argument is to be followed, it would mean that, although the skilled person has reduced the distribution ratio from 50% to 40%, he has left the hook denier unchanged at 330. The board therefore would see no reason for him to change the hook denier from 330 if he were to further reduce the distribution ratio to approximately 33%.

In the oral proceedings the board expressed this view to the appellant who immediately amended his argument to one in which it would be obvious for the skilled person to start from hooks with a distribution ratio of 50% with a denier of 330 and to progressively reduce the distribution ratio and increase the denier to

arrive at the claimed subject-matter. This implies that, at a distribution ratio of 40%, the denier would be more than 330.

The appellant, by confidently presenting two mutually exclusive obviousness arguments based on the same facts, places doubt on both of them. The board does not find either argument convincing.

5.2.4 Thus the board does not consider that, using D1 on its own, it would be obvious to reduce the distribution ratio and increase the hook denier to arrive at the claimed distribution ratio and within the claimed denier range.

5.3 The appellant argued that other documents on file disclose distribution ratios below 50% and so would lead the skilled person to reduce the distribution ratio of the D1 fastener.

5.4 When calculating the distribution ratios of Figures 5(1) to 5(8) of D2 it must be borne in mind that the Figures may well be schematic and that, in reality, each row might be longer with more hooks and loops. This would mean that the true distribution ratios would differ from those apparently shown by some of the Figures.

It is noted that there is no arrangement in D2 in which, in each row, each hook has a loop on each side thereof (note that the present patent consistently claims, describes and shows fasteners wherein "in each row, each hook element (3) has a loop element (2) on each side thereof". A hook with a loop on each side thereof might appear to be the case for the lower row

in Figure 6 of D2 but this Figure is merely a part section of Figure 5(8).

If one is able to assume that the Figures are not schematic, then Figures 5(1), 5(2), 5(3), 5(6) and 5(8) show distribution ratios of 50% while Figures 5(5) shows a distribution ratio of 40%. Thus these Figures are no more relevant than D1.

In each row in Figure 5(7) two loops are followed by two hooks and then by two loops. If, in reality, a row is longer than that shown, i.e. with more hooks and loops, then the distribution ratio would approach 50%. However, if one could accept that the Figure is not schematic, then the distribution ratio would be 33%.

However even if one did accept that the skilled person could borrow from Figure 5(7) of D2 the teaching of a 33% distribution ratio, then he would also borrow the two loops - two hooks - two loops arrangement by which the distribution ratio of 33% is achieved. He would then arrive at a fastener which does not satisfy the present claim 1.

5.5 The appellant argues that Figure 1 of D3 shows a row in which each hook 3 is between two loops 2 yielding a distribution ratio of 33%.

However this is incorrect since there is a hook at the extreme top left of Figure 1 that does not have a loop on one side and the same can be said of the hook at the extreme bottom right of Figure 1. In addition the hooks are the same height as the loops. Therefore in these two respects Figure 1 shows something different to what is claimed.

Moreover the appellant has not filed a translation of D3 and so one cannot be sure what Figure 1 shows. Thus, although the appellant maintains that there are two loops between a pair of hooks, it might in fact be a tuft (multifilament yarn) of loops. Then the distribution ratio would not be 33%.

Doubts as to the lack of disclosure of D3 cannot work to the advantage of the party (i.e. the appellant) relying on D3. Therefore the board cannot accept that D3 discloses a 33% distribution ratio.

5.6 It is undisputed that D5 is not part of the state of the art under Article 54(**2**) EPC.

Neither can D5 (European **patent** specification EP-**B**-0 604 869) be part of the state of the art under Article 54(**3**) EPC because the latter refers to "the content of European patent **applications as filed**".

Moreover, even if D5 were part of the state of the art under Article 54(3) EPC, it still could not be considered in deciding inventive step.

The appellant argued that statements in D5 that hooks of more than 300 e.g. 320 to 500 denier are conventional prove that the feature in the present claim of hooks of 400 to 700 denier was part of the skilled person's knowledge at the date of the present patent.

Thus D5 is part of an inventive step attack. However Article 56 EPC states that "If the state of the art also includes documents within the meaning of Article 54, paragaph 3, these documents are not to be

considered in deciding whether there has been an inventive step".

Thus, even if D5 were part of the state of the art under Article 54(3) EPC, it still could not be considered in deciding inventive step. D5 has to be totally disregarded.

Nevertheless, despite ignoring the contents of D5, the board accepts the basic argument of the appellant that hooks of higher denier than the 330 denier of D1 were known per se.

5.7 D6 discloses a fastener with hooks 4 and loops 3. It can be seen in Figures 1a to 1c and 2a to 2d that the loops are higher than the hooks. While lines 7 to 9 of page 3 of D6 state that "the loops are ... preferably slightly higher with respect to the hooks", no specific figure or range is given for the height difference (compare the present claim 1 which specifies that the loops are 0.1 mm to 2.5 mm higher than the hooks).

The jagged edges and the straight edges of the fastener in Figure 3 indicate that the warp direction (i.e. the columns) is from the top left of the page to the bottom right while the weft direction (i.e. rows) is from the bottom left of the page to the top right. Figure 3 shows hooks 4 intermingled with loops 3 but the hooks are in rows with no intervening loops (compare the present claim 1 which specifies that, in each row, each hook has a loop on each side thereof).

It appears that there is a row of eight hooks followed by a row of six groups of four loops and so on. This would yield a distribution ratio of 25% (compare the

present claim 1 which specifies a distribution ratio of approximately 33%). However it must be borne in mind that Figure 3 is plainly schematic and calculating like this is akin to the forbidden practice in the case law of the EPO of measuring schematic drawings.

Moreover, since Figure 3 and all the other Figures show all the loops of a group emerging from a single point of the base material, and since e.g. page 4, line 13 refers to "loop pile loops", the board suspects that the group of loops is in fact an indeterminate number of loops (e.g. resulting from the use of a multifilament yarn) arranged at random to form a tuft of loops which the person drawing the Figures has chosen for neatness and simplicity to represent as a tuft of four loops.

Accordingly the board concludes that D6 discloses very little of the subject-matter of the present claim 1. In particular, the board considers that no meaningful distribution ratio can be inferred from D6.

5.8 The appellant's arguments on inventive step rely on the skilled person cherry-picking from various documents of the prior art just those features that are needed to modify the fastener of D1 to arrive at a fastener within the scope of claim 1 while leaving behind all those features which would move the fastener outside the scope of claim 1. As the skilled person could only do this if he had knowledge of the present invention, this is an impermissible, ex post facto analysis.

Thus the skilled person is supposed to take the distribution ratio of 33% from Figure 5(7) of D2 (although it is not sure that this is in fact what the

Figure teaches. In any case he does not take the pattern by which this distribution ratio is achieved and not the equality of the hook and loop heights). Or he takes the distribution ratio from D3 (but the disclosure of D3 is far from clear).

Alternatively he uses the distribution ratio of D6 (even though no meaningful distribution ratio can be derived from D6). Even if he could derive a ratio of 25%, the inventive step argument relies on the skilled person not taking exactly this ratio but in some way combining it with the known 40% of D1. Further he does not take from D6 the feature of the hooks being in rows with no intervening loops.

The appellant has produced no evidence for his argument that it would be obvious to reduce the distribution ratio of the D1 hooks and increase their unit strength by increasing the denier.

5.9 The board thus cannot see that any of the prior art documents relied upon in the appeal proceedings (taken singly or in combination) would lead the skilled person in an obvious manner to the subject-matter of claim 1 as granted.

The board thus finds that the subject-matter of claim 1 as granted is not obvious (Articles 52(1) and 56 EPC).

6. Thus claim 1 as granted is patentable as are claims 2 to 4 which are dependent thereon. Accordingly the patent can be maintained unamended i.e. as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Magouliotis C. Andries