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D E C I S I O N
of 20 July 2004

Case Number: T 0106/02 - 3.2.7

Application Number: 94100377.4

Publication Number: 0609668

IPC: B26D 3/16

Language of the proceedings: EN

Title of invention:
Variable velocity conveying method and apparatus for continuous motion saws

Patentee:
Paper Converting Machine Company

Opponent:
FABIO PERINI S.p.A.

Headword:
-

Relevant legal provisions:
EPC Art. 56, 123(2)

Keyword:
"Added subject-matter new ground - no"
"Added subject-matter - no"
"Inventive step - yes"

Decisions cited:
G 0010/91

Catchword:
-

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Case Number: T 0106/02 - 3.2.7

D E C I S I O N
of the Technical Board of Appeal 3.2.7
of 20 July 2004

Appellant: (Opponent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 27 November 2001 rejecting the opposition filed against European patent No. 0609668 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: A. Burkhart
Members: P. A. O'Reilly
E. Lachacinski

Summary of Facts and Submissions

I. The appellant (opponent) filed an appeal against the decision of the Opposition Division to reject the opposition against the European Patent No. 0 609 668.

II. Opposition was filed against the patent as a whole and based on Article 100(a) EPC (lack of inventive step).

The Opposition Division held that the subject-matter of claims 1 and 3 of the main request was novel and involved an inventive step and the claims did not infringe Article 123(2) EPC.

The most relevant prior art documents for the present decision are:

D1: US-A-4 041 813

D2: EP-A-0 507 750

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

The respondent requested that the appeal be dismissed.

Alternatively the respondent requested that the decision under appeal be set aside and a patent be granted on the basis of the first to fourth auxiliary requests filed with letter of 18 June 2004.

IV. The independent claims of the patent as granted read as follows:

"1. Method of operating a skewed orbiting saw (23) for transversely cutting continuously advancing elongated lengths of multi-ply web material into shorter lengths, said saw (23) having a substantially constant speed component (V_B) parallel to said elongated lengths during cutting; the method comprising advancing said elongated lengths at a speed (V_C) substantially equal to said saw speed component during cutting,

characterised by setting the desired length of said shorter lengths, and varying the speed of advance of said elongate lengths between consecutive cuts from said substantially equal speed, while maintaining said saw at said substantially constant speed, by producing

first an acceleration followed by a deceleration if the setting requires a spacing between cuts greater than the spacing that would be produced by said equal speed, and

first a deceleration followed by an acceleration if the setting requires spacing between cuts less than the spacing that would be produced by said equal speed."

"3. Apparatus for carrying out the method of claim 1:

comprising a frame (20);

conveyor means (22) on said frame (20) for advancing said elongated lengths along a linear path;

a saw (23) mounted on said frame for movement through an orbit skewed with respect to said path, said saw having a substantially constant speed component (V_B) parallel to said linear path during cutting;

drive means (30) operably associated with said conveyor means (22) for advancing said elongated lengths at a speed (V_C) substantially equal to said saw speed component during cutting,

characterised in that the drive means (30) includes a settable servo controller (29) which varies the speed of advance of said elongate lengths between consecutive cuts from said substantially equal speed by producing

first an acceleration followed by a deceleration if the setting requires a spacing between cuts greater than the spacing that would be produced by said equal speed, and

first a deceleration followed by an acceleration if the setting requires spacing between cuts less than the spacing that would be produced by said equal speed."

V. The appellant argued in written and oral submissions essentially as follows:

(i) The ground under Article 123(2) EPC was discussed in the opposition proceedings and is mentioned in the grounds of the decision of the Opposition Division. The ground is not therefore a new ground and hence can be discussed without the permission of the proprietor.

(ii) If claims 1 and 3 are interpreted to mean that there is a decision step as part of the way that the machine operates such as to choose one of two alternative routes between cuts, i.e. acceleration followed by deceleration or deceleration followed by acceleration, then this was not disclosed in the application as filed. The machine as originally disclosed could be operated in two different ways. These were disclosed as alternatives. One alternative is disclosed in

figures 6 to 8 and the other alternative is disclosed in figure 9. If the claims are considered to define two routes within one method or machine then this was not disclosed. Claims 1 and 3 in fact must be considered as defining alternative methods of operating the machines or alternative machines respectively. Even though the claims refer to acceleration followed by deceleration and deceleration followed by acceleration these two possibilities are each qualified by an "if" condition so they in fact are alternatives. In claim 1 the step of setting the length is not part of operating the machine and so should not be considered. There is no decision step in claim 1 but there are just two alternative methods of operating the machine.

(iii) The subject-matter of claim 1 does not involve an inventive step. The closest prior art is document D1. This document discloses the features of the preambles of claims 1 and 3. The document also discloses the feature of setting the length since this is possible by removing one of the circular saws which results in doubling the length.

The problem to be solved compared to the closest prior art is to provide flexibility in setting the lengths of the cut rolls.

Document D2 discloses a cutting machine in which flexibility in setting the length of the cut rolls is achieved by varying the speed of the conveyor between cuts. The document discloses not only specifically accelerating followed by decelerating

between cuts but also varying the speed between cuts in general. If the speed is varied in general then this would also involve decelerating followed by accelerating. The skilled person would apply this solution to the machine known from document D1 and arrive at a method of operating a machine and a machine in accordance with claims 1 and 3 respectively.

There is no prejudice against applying the teaching of document D2 to document D1. The constructional changes necessary to document D1 are either evident for the skilled person or already contained in document D2. Although document D2 mentions certain disadvantages in document D1 these concern a different aspect of the machine. Also when document D2 mentions an acceleration followed by a deceleration this is in the context of a reciprocating saw for which it is desirable that a slow speed is used for the speed during cutting and hence that between cuts an acceleration is followed by a deceleration. When however the teaching of document D2 is applied to document D1 this reason for an acceleration followed by a deceleration would not apply. In document D1 the speed of the logs during cutting is not chosen but is given by the machine. The skilled person when applying the teaching of document D2 would realise that in order to achieve desired roll lengths it would sometimes be necessary to accelerate and then decelerate between cuts and sometimes it would be necessary to decelerate and then accelerate between cuts.

VI. The respondent argued in written and oral submissions essentially as follows:

(i) Article 123(2) EPC was not relied on as a ground of opposition by the appellant. The proprietor does not agree with allowing the ground into the appeal proceedings.

(ii) Claims 1 and 3 have to be interpreted as defining a single operating method and machine and this was disclosed in the application as filed. It is clear that a single method is defined which involves a decision step based on the desired length of the cut roll. The length is given as an input and based on this one of two possible branches of an operating path is chosen. This is made clear in the application as filed by a comparison of figures 8 and 9 whereby figure 8 shows the arrangement required to produce longer rolls and figure 9 shows the arrangement necessary to produce shorter rolls. These are not alternative embodiments but merely the different steps required to deal with differing desired lengths.

(iii) The subject-matter of claims 1 and 3 involves an inventive step. The nearest prior art is document D1 and the respondent agrees that the problem to be solved is to provide a quick change in the desired cut-off length.

Document D2 discloses only an acceleration followed by a deceleration. There is no indication in document D2 of a deceleration followed by an acceleration. Although document D2 mentions

variation of speed this only refers to the variation upwardly between cuts. The parts of document D2 which refer to varying the speed between cuts refer to varying the amount by which the speed varies upwardly.

The skilled person would not apply the teaching of document D2 to document D1 as to do this the machine of document D1 would require to be changed in many ways. Also the application of the teaching of document D2 to document D1 would go against the inertia considerations made in document D2 which indicate that the speed during cutting should be kept to a minimum.

Even if the skilled person did combine the teaching of document D2 with document D1 he still would not arrive at the subject-matter of claims 1 and 3 since document D2 only teaches a speed increase between cuts whereas according to these claims there should also be a speed decrease between cuts.

Reasons for the Decision

1. *Article 123(2) EPC*

1.1 The question arose as to whether a ground under this article was part of the proceedings before the first instance and hence was not barred from discussion without the permission of the proprietor in the appeal proceedings following Enlarged Board of Appeal decision G 10/91. During the opposition proceedings the

appellant in a written submission dated 1 October 2001 argued that the interpretation of claim 1 by the Opposition Division in the opinion accompanying the invitation to oral proceedings would not be in accordance with Article 123(2) EPC. In the oral proceedings before the Opposition Division the appellant reiterated this view. In their decision the Opposition Division discussed their interpretation of claim 1 and considered that it was in accordance Article 123(2) EPC. At the end of the their decision grounds the Opposition Division concluded that grounds mentioned in Article 100(a) EPC did not prejudice the maintenance of the patent unamended.

Although the Opposition Division did not mention Article 123(2) EPC in their explicit conclusions they nevertheless devoted two paragraphs explaining why claim 1 in their opinion did not infringe Article 123(2) EPC. Thus, this ground was mentioned in the written and oral proceedings and formed part of the discussion contained in the grounds of the decision. For this reason the Board concludes that this ground was in the first instance proceedings and hence could be discussed in the appeal proceedings without requiring the permission of the proprietor.

1.2 Regarding the ground itself the consideration of this ground is dependent upon the interpretation of claim 1. The claim is directed to a method of operating a machine which requires that a desired length is set and that then the speed of advance is varied. The speed is increased if the spacing between cuts needs to be greater "and" decreased if the spacing between cuts needs to be less.

In the view of the appellant the application as filed disclosed two alternative operating methods and the claims as granted continue to define two alternative operating methods. The appellant correspondingly considers that if the claims are considered to define a single operating method then this was not originally disclosed. Although the claims include the conjunction "and" between the two types of speed change the appellant correctly pointed out that this is qualified in each case by an "if" so that the combined effect of the "if"s and the "and" is indeed to give an 'or' situation which depends upon the desired spacing between cuts.

The essential question to be considered is whether there is a single operating method which includes two branches based on a decision within the operating method, or whether there are two alternative operating methods. The Board is of the opinion that the former interpretation is correct. The reason is that as part of the operating method the desired length is set and the selection of either an increased or a decreased speed between cuts is dependent upon this set length so that the selection of the increased or decreased speed is part of the operating method. The appellant argued that the setting of the length was not part of the method of operating the machine as this was only an input into the machine. The Board does not follow this argument since the setting of the length is an essential step and furthermore this step itself leads to another step which takes place within the operating method namely the selection of the speed profile.

1.3 The claims according this interpretation are also based on the application as filed. The claims of the application as filed referred to "varying the speed of advance … by accelerating/decelerating". The claims were thus indeterminate as to the distribution of the acceleration and the deceleration. There is a description of a machine in figure 1 of the description. There is an embodiment of the operation in figures 6 to 8 in which there is an acceleration followed by a deceleration which is used to permit larger roll lengths. With respect to a figure 9 it then stated that in similar fashion the invention provides means for shortening the roll lengths by a deceleration followed by an acceleration. In the discussion of figures 10 to 12, which are principally concerned with a feature of the log movement during cutting, it is stated that "it is possible according to the invention … to speed up or slow down the conveyor between cuts". The Board concludes from this that the speeding up or slowing down was part of a single operating method based on a single machine in which the selection of speeding up or slowing down is determined by the desired roll length to be cut. This means that the subject-matter of claims 1 and 3 as interpreted by the Board was also disclosed in the application as filed and hence does not extend beyond the content of the application as filed.

1.4 The Board thus concludes that the patent as granted does not offend against Article 123(2) EPC.

1.5 The above interpretation by the Board of claim 1 is also used in the grounds under Article 100(a) EPC discussed below.

2. *Novelty*

Although the Opposition Division decided that the subject-matter of claims 1 and 3 was novel this ground in fact was not in dispute between the parties.

3. *Inventive step*

3.1 Closest prior art

The closest prior art is represented by document D1 which discloses a method and apparatus comprising the features of the preambles of claims 1 and 3 respectively. In addition, document D1 discloses setting the desired length of said shorter lengths as specified in the characterising portion of claim 1.

3.2 Problem to be solved

The objective problem to be solved by the distinguishing features is to allow the lengths of the rolls to be cut to be varied more flexibly.

3.3 Solution to the problem

The solution to the problem is, in the case of the method, varying the speed of advance of said elongate lengths between consecutive cuts from said substantially equal speed, while maintaining said saw at said substantially constant speed, by producing first an acceleration followed by a deceleration if the setting requires a spacing between cuts greater than the spacing that would be produced by said equal speed, and first a deceleration followed by an acceleration if

the setting requires spacing between cuts less than the spacing that would be produced by said equal speed.

In the case of claim 3 corresponding apparatus features are provided.

3.4 The solution to the problem is not obvious for the following reasons:

3.4.1 Document D1 concerns a skewed orbiting saw. Such saws include a rotating plate to which two circular saws are attached. As the plate rotates the saws in turn cut through a so-called log, usually forming toilet tissue or other multi-ply tissue, so as to produce the desired length. The plate is arranged at a skewed angle to the direction of movement of the log so that as the circular saw cuts through the log there is also longitudinal motion of the saw at the same speed as the speed of advancement of the log in order to produce a smooth cut. According to document D1 the length of the cut roll may only be set by removing one of the circular saws. This doubles the time interval between cuts and hence doubles the length of the cut roll. There are just two possible lengths with no flexibility in setting other lengths. For this reason the objective problem must be seen in providing a skewed orbiting saw with more flexibility in setting the lengths.

Document D2 is principally concerned with another problem which arises out of the teaching of document D1, namely the sinusoidal motion of the circular saws which occurs while the cutting is taking place. Document D2 solves this problem by replacing the skewed orbiting saw with a reciprocating saw. This

reciprocating arrangement improves the productivity and also overcomes a problem of inertia that occurs in machines which advance the log intermittently. According to document D2 the speed of advance of the log is not constant, as in document D1, but may vary between the speed during cutting, which is the minimum speed, and a maximum speed which is between cuts (column 2, lines 19 to 26). This feature is explained as achieving a number of advantages when used in combination with the reciprocating cutting tool (column 2, lines 26 to 32). Furthermore, it is explained that the feature allows the length of the rolls to be easily changed (column 2, lines 33 to 36).

3.4.2 Document D2 in column 3, lines 4 to 9 refers to a higher speed between subsequent cuttings. In column 5, lines 51 to 58 it is explained that the motion of the logs is variable with a higher speed when the blade is clear of the logs, i.e. between cuts. In column 7, lines 26 to 29 it is explained that the effect of the variation of speed during time interval T2 is to vary the length of the cut rolls. Time interval T2 is the time interval between cuts and in the preceding part of the description it had been explained with reference to Figures 4A to 4D how the log speed is increased between cuts during time T2 by a variable amount. Claim 8 of document D2 makes a general reference to varying log speed and claim 20, which is not dependent on claim 8, refers to a higher speed between cuts.

From the above mentioned sections of document D2 the Board concludes that document D2 only discloses an acceleration followed by a deceleration between cuts.

There is no disclosure of a deceleration followed by an acceleration.

3.4.3 It must next be considered whether a skilled person would consider apply the teaching of document D2 to the machines known from document D1. The Board considers that the skilled person would consider applying the teaching. Although document D2 discusses disadvantages of machines known from document D1 these disadvantages concern the arrangement of the cutting device in document D1, i.e. the skewed orbiting saws, not the arrangement for dealing with cutting rolls of differing lengths. There is thus no prejudice in applying this part of the teaching to document D1 in order to solve the objective problem. Moreover, the constructional changes mentioned by the respondent are either within the normal practice of the skilled person or already disclosed in document D2.

3.4.4 Finally, it must be considered how the skilled person would apply the teaching of document D2 to a machine known from document D1. The Board first notes that the direct application of the teaching of document D2 to document D1 results in a machine and method of operating the machine in which there is only an acceleration followed by a deceleration between cuts. The appellant has argued that the skilled person would have to go a step further. The appellant argued that the speed of the logs through the machine in document D1 is given by the machine and cannot be chosen, i.e. that this speed would have to be taken as fixed. Therefore, when the logs are to be cut into rolls of differing lengths it could be necessary to accelerate and then decelerate or *vice versa* depending on this

fixed speed and the desired length. The Board cannot agree with this argument. First of all the appellant gave no basis for the argument that the speed of the logs in document D1 is given and not chosen. A machine according to document D1 may have a saw which operates at a fixed speed after the machine has been set up. This fixed speed can however be decided freely at the start. The power is supplied to the rotating plate via a gear box. The gear box can clearly be arranged to supply a particular desire rotation rate for the rotating plate which in turn will determine the speed of advance of the logs during cutting. According to document D2 the lowest speed occurs during cutting and is determined by the cutting tool and then between cuts the speed is increased to determine the roll length. When applying this teaching to document D1 the skilled person would also set the rate of rotation of the skew plate such that the log speed is a minimum during cutting and then increase the speed between the cuts. The appellant has not shown that in a machine according to document D1 the log speed during cutting is so fixed that the skilled person applying the teaching of document D2 to document D1 would necessarily be confronted with a specific fixed log speed during cutting. Therefore the arguments of the appellant that this would lead sometimes to a deceleration followed by an acceleration do not hold water.

3.5 Therefore, the subject-matter of claims 1 and 3 of the main request involve an inventive step in the sense of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Nachtigall A. Burkhart