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**D E C I S I O N**  
**of 30 March 2004**

**Case Number:** T 0535/03 - 3.2.7

**Application Number:** 95309310.1

**Publication Number:** 0718196

**IPC:** B65B 51/30

**Language of the proceedings:** EN

**Title of invention:**  
Transverse sealer

**Patentee:**  
ISHIDA CO., Ltd.

**Opponent:**  
Rovema Verpackungsmaschinen GmbH

**Headword:**  
-

**Relevant legal provisions:**  
EPC Art. 54, 56, 123

**Keyword:**  
"Formulation of the technical problem, inventive step (yes)"

**Decisions cited:**  
-

**Catchword:**  
-



Case Number: T 0535/03 - 3.2.7

**D E C I S I O N**  
of the Technical Board of Appeal 3.2.7  
of 30 March 2004

**Appellant:** ISHIDA CO., Ltd.  
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**Respondent:** Rovema Verpackungsmaschinen GmbH  
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**Representative:** von den Steinen, Axel  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 12 March 2003  
revoking European patent No. 0718196 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** A. Burkhart  
**Members:** H. E. Felgenhauer  
E. Lachacinski

## Summary of Facts and Submissions

- I. The appellant (patent proprietor) filed an appeal against the decision of the Opposition Division revoking the European patent No. 0 718 196.

Opposition had been filed against the patent as a whole based on the grounds of opposition according to Article 100(a) EPC (lack of novelty and of inventive step) and Article 100(c) EPC (added subject-matter).

The Opposition Division held that the patent had to be revoked since the subject-matters of claims 1 and 10 lack inventive step in view of the documents

D1: US-A-5 279 098

D3: EP-A-0 226 693

D4: DE-A-43 15 068.

- II. Oral proceedings before the Board of Appeal were held on 30 March 2004.

(i) The appellant (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained in amended form with amended claims 1 to 12 and an amended description (pages 1 to 6) as filed on 30 March 2004, and drawings (Figures 1 to 10) as granted.

(ii) The respondent (opponent) requested that the appeal be dismissed.

Claim 1 reads as follows:

"1. A transverse sealer (110) for transversely sealing an elongated tubular film (f) delivered along a specified film path, the transverse sealer comprising:

    a sealing means (1) including a pair of sealing units (1) disposed on opposite sides of said film path and each supported at one end by one of a pair of rotary arms (2) adapted to rotate around respective shafts (3), said pair of sealing units being adapted to undergo continuous cyclic motion along a closed trajectory having a cycle time period, and transversely seal said film to thereby form a bag while moving on an adjacent path along said film path, said adjacent path including a stripping region in which said sealing units serve to strip said film and a sealing region where said sealing units transversely seal said film, said sealing units passing said stripping region immediately before passing said sealing region in said cyclic motion; and

    a drive means for delivering the elongated tubular film to the sealing means along the specified film path, wherein the drive means delivers a predetermined length of film to the sealing means over the cycle time period, and wherein the film is delivered at a film delivery speed wherein the sealer further comprises

    a control unit (10) for varying the speed of the sealing means (1) and/or the film delivery speed in the stripping and the sealing regions such that the film delivery speed is greater than the speed of the sealing means in the sealing region, and slower than said sealing means in the stripping region, and wherein the control unit varies the speed of the sealing means in

said cyclic motion such that the cycle time period and the delivery of the predetermined length of film over the cycle time period are maintained substantially constant".

III. The arguments of the appellant can be summarised as follows:

- (i) Document D1 constituting the closest prior art discloses a transverse sealer for transversely sealing an elongated tubular film. Corresponding to the transverse sealer of claim 1 sealing means include a pair of sealing units being adapted to undergo continuous cyclic motion along a closed trajectory moving on an adjacent path along the film path. The adjacent path includes a stripping region in which the sealing units serve to strip the film and a sealing region wherein the sealing units transversely seal the film. The sealing units pass the stripping region immediately before passing the sealing region in this cyclic motion.

Stripping of the film prior to sealing has the advantage that articles to be filled into a bag, which have a low volume density, are moved from the seal area into the bag which results in a more dependable seal.

Stripping, however, also has the disadvantage, that it leads to the portion of the tubularly formed film above the seal

jaws getting reduced such, that filling of the next bag requires more time.

- (ii) Starting from the transverse sealer according to document D1 and considering the features distinguishing the transverse sealer according to claim 1 from the one according to document D1, the problem to be solved is directed to this negative effect of stripping being minimised.
- (iii) Formulation of a problem which does not take into account the negative effect of stripping which occurs in the operation of the transverse sealer according to document D1 is not appropriate with respect to the examination of inventive step, since such an approach amounts to document D1 not being considered in its entirety.
- (iv) A solution to this problem which would be obvious, in that it would come within the operation of the transverse sealer as disclosed in document D1, consists in minimising the negative effect of stripping, e.g. by shortening the time allowed for stripping or correspondingly the stripping region.
- (v) The problem referred to in the decision under appeal, according to which, starting from document D1, filling of bags is to be improved by using the blousing effect, is formulated erroneously since document D1

does not contain a reference to blousing. Thus the problem is formulated such that it already contains a reference to the solution according to the patent in suit.

- (vi) Document D3 relates to a transverse sealer according to which the bag length can be varied. According to this document this variation is made possible by the relationship of the speed of the sealing means and the film delivery speed being varied. As an effect inherent to this variation of speeds it is mentioned within document D3, that blousing can occur. In this connection it is indicated how this blousing effect can be minimised and that blousing to a minor extent can be advantageous with respect to filling of the bags.
- (vii) Stripping is not mentioned in document D3. To enable the advantageous effect which according to document D1 is obtained by stripping, document D3 however proposes a different approach, according to which the film delivery speed is set such that it comes close to the speed of articles being dropped into the bags.
- (viii) Document D3 disclosing a different approach with respect to stripping and showing blousing as being inherent to the proposed variation of the length of bags, cannot be considered as giving an indication leading

to solving the problem underlying the transverse sealer according to document D1 by a variation of the speed of the sealing means and/or the film delivery speed in the sealing region, such that following stripping of the bags the tubularly formed film is fully expanded (or bloused), making it easier even for articles with a small volume density to fall quickly towards the bottom of a bag being produced.

- (ix) Document D4 discloses a device for the production of bags comprising a transverse sealer, which is designed for easily implemented changes with respect to the shape and length of bags and the like. According to this document the drives for film delivery and for the cyclic motion of the sealing means can be coupled, such that tubular film can be stripped, stretched or bloused to produce bags of particular shape. Since these effects are solely related to the shape of bags and since filling of bags is not referred to in this document, its consideration in combination with document D1 and/or document D3 could not have given an indication leading to the transverse sealer according to claim 1.
  
- (x) Furthermore according to documents D1, D3 and D4 stripping and/or blousing, respectively, are referred to as individual steps without any indication being given

that stripping and blousing are employed in combination as defined in claim 1.

- (xi) The arguments given with respect to the transverse sealer according to claim 1 apply correspondingly with respect to the method according to claim 10.

IV. The arguments of the respondent can be summarised as follows:

- (i) Document D1 disclosing a transverse sealer for transversely sealing an elongated tubular film, according to which the tubular film is stripped prior to sealing, is considered as constituting the closest prior art.
- (ii) The subject-matter of claim 1 of the patent in suit is distinguished from the transverse sealer according to document D1, in that after stripping blousing is provided for by varying the speed of the sealing means and/or the film delivery speed as defined in claim 1. While stripping is performed in a stripping region, immediately before the sealing units pass into the sealing region, blousing is performed separately in the sealing region.
- (iii) Consequently variation of speed resulting in blousing is completely independent of the variation of speed resulting in stripping.

- (iv) Formulating the objective problem starting from document D1 it is thus not justified to consider next to the distinguishing feature, namely the variation of speed resulting in blousing, also the variation of speed resulting in stripping as being already known from document D1.
  
- (v) A first problem to be solved starting from document D1, which is solved by the transverse sealer according to claim 1 comprising this distinguishing feature, can be seen in the development of a transverse sealer enabling bags to be filled more easily, the transverse sealer thus having a higher filling rate.
  
- (vi) A second problem to be solved starting from document D1, which is solved by the transverse sealer according to claim 1 comprising this distinguishing feature, can be seen in the development of a transverse sealer such that the length and the shape of bags can be varied easily.
  
- (vii) Both problems are addressed in document D3 which discloses a bag maker comprising a transverse sealer for transversely sealing an elongated tubular film, which is designed such that the length of bags can be varied arbitrarily due to the fact, that the speed of the sealing units and the film delivery speed are varied appropriately. In connection with the variation of the length

of bags it is mentioned that blousing can occur and that this can positively effect filling of articles into bags.

(viii) It is thus obvious that, starting from the transverse sealer according to document D1, the first problem is solved by varying the speed in the manner suggested in document D3. Since this variation of speed corresponds to the one which according to claim 1 of the patent in suit takes place in the sealing region, which leads to blousing, the subject-matter of claim 1 does not involve an inventive step.

(ix) Starting from the transverse sealer according to document D1 it is likewise obvious to solve the second problem considering document D3, according to which bags can be filled faster due to blousing.

(x) Starting from the transverse sealer according to document D1 it is furthermore obvious to consider document D4 in an attempt to vary the shape and length of bags. Since according to document D4 blousing is, next to stripping and stretching, one of the effects leading to a variation of the shapes and length's of bags, the transverse sealer according to claim 1 likewise does not involve an inventive step in view of a combined consideration of documents D1 and D4.

- (xi) For reasons corresponding to the ones given with respect to claim 1 the subject-matter of claim 10 likewise does not involve an inventive step.

## **Reasons for the Decision**

### 1. *Amended claims*

Claims 1 and 10 underlying the decision under appeal have been amended, essentially further defining the sealing means, as including a pair of sealing units, and its motion, in that a path for the sealing units adjacent the film path is defined. These amendments, which have not been objected to, satisfy the requirements of Articles 123(2) and (3) EPC.

Claims 1 and 10 as filed with the grounds of appeal have been further amended defining, that each one of the pair of sealing units is supported "at one end by one of a pair of rotary arms (2) adapted to rotate around respective shafts (3)". This addition further defines the subject-matter of these claims in view of the transverse sealers according to documents D3 and D4 and their methods of operation. The added feature is disclosed within the application as filed (column 3, lines 35 to 48; Figure 2).

These amendments to claims 1 and 10 are thus likewise admissible (Articles 123(2) and (3) EPC).

2. *Novelty*

Novelty has no longer been disputed. The transverse sealer according to claim 1 differs from the one according to document D1 in that a control unit is provided for varying the speed of the sealing means and/or the film delivery speed in the sealing region such that the film delivery speed is greater than the speed of the sealing means in the sealing region.

The subject-matter of claim 1 is thus novel in the sense of Article 54 EPC. This applies likewise with respect to the subject-matter of claim 10 for a corresponding reason.

3. *Inventive step*

3.1 Closest prior art

It is undisputed that document D1 discloses a transverse sealer for transversely sealing an elongated tubular film comprising sealing means and drive means as defined in claim 1.

The known transverse sealer furthermore comprises a control unit for varying the speed of the sealing means, in a "squeezing region", which in the terminology of the patent in suit corresponds to the stripping region, such that the film delivery speed is slower than said sealing means in the stripping region (column 6, lines 53 to 63; Figure 7).

The transverse sealer according to claim 1 of the patent in suit thus differs from the one according to

document D1 in that the control unit additionally provides "for varying the speed of the sealing means and/or the film delivery speed in ... the sealing region such that the film delivery speed is greater than the speed of the sealing means in the sealing region" (blousing effect; cf. patent in suit, column 5, lines 1 to 6), wherein "said sealing units pass the stripping region immediately before passing the sealing region in the cyclic motion".

Consequently the transverse sealer according to claim 1 is distinguished from the one known from document D1 by features defining that blousing is provided for, that blousing is performed by means of a control unit for varying the speed of the sealing means and/or the film delivery speed and defining where within the cyclic motion of the sealing units blousing occurs.

### 3.2 Problem

It is undisputed that the problem relied upon in the decision under appeal (grounds, No. 3.) is defined too narrowly. Referring to a skilled person who wishes to improve the filling of bags being produced by using the blousing effect, the problem already comprises an essential feature of the solution.

It is however disputed in which manner the objective problem has to be formulated, which, starting from document D1, underlies the patent in suit.

According to the appellant formulating the problem underlying the patent in suit, document D1 being the starting point needs to be considered in its entirety.

Consequently the problem to be solved has to be seen as originating from the known stripping which, as indicated in the patent in suit, is advantageous in that prior to sealing powder-like small articles remaining in the seal area are removed, resulting in a more dependable seal (column 1, lines 25 to 34; column 5, lines 17 to 19), but also has the disadvantageous effect that the cross-sectional area of the tubularly formed film above the seal jaws is reduced, making it harder for the next batch of articles being dropped into the next bag to quickly drop deeply into the bag (column 1, lines 29 to 41).

According to the appellant the objective problem underlying the patent in suit thus consists in maintaining stripping and its advantageous effect, while its disadvantageous effect is minimised (patent in suit column 1, lines 29 to 41; column 8, lines 1 to 9). The transverse sealer solving this problem thus enables the productivity of a bag maker in which it is incorporated, to be improved (column 2, lines 38 to 40).

According to the respondent stripping and blousing as provided according to claim 1 are completely independent of each other. Starting from the transverse sealer according to document D1 the objective problem underlying the patent in suit thus needs to be derived considering the distinguishing feature in isolation, according to which the speed can be varied such that blousing occurs.

According to the respondent following this approach two objective problems can be derived.

The first problem consists in the development of a transverse sealer enabling bags to be filled more easily, the transverse sealer thus having a higher filling rate.

The second problem consists in the development of a transverse sealer such that the length and the shape of bags can be varied easily.

The Board is of the opinion that formulating the objective technical problem it is not sufficient to consider only part of the features distinguishing the transverse sealer according to claim 1 from the one according to document D1, disregarding the feature defining where, within the cyclic motion of the sealing units, blousing is provided for. Furthermore the Board is of the opinion that the feature defining that blousing is provided cannot be seen in isolation, since the problem needs to be formulated based on what the skilled person objectively recognises as the problem when comparing document D1 as closest prior art with the subject-matter of claim 1.

Proceeding in this manner it is apparent that the transverse sealer according to document D1 is advantageous due to stripping being provided, in that it leads to proper sealing being ensured, and that stripping at the same time has the disadvantageous effect which, due to the reduction of the cross-section of the bags coming with stripping, leads to rapid filling of the next bag being obstructed.

The objective problem underlying the patent in suit is thus to minimise the disadvantage of stripping, while

maintaining it due to its advantageous effect, as indicated in the patent in suit (column 1, lines 25 to 41).

Formulation of the first and second problem as suggested by the respondent completely ignores the presence of stripping, with its advantageous as well as its disadvantageous effect, and thus does not have its proper starting point in document D1. These problems thus do not correspond to the problem the person skilled in the art recognises starting from the transverse sealer known from document D1.

In other words the first or the second problem suggested by the respondent, which concern a higher filling rate or a variation of the length and shape of bags, are general problems which, as stated by the respondent are possible with respect to the transverse sealer according to document D1, but which do not relate to the specific nature this transverse sealer has due to stripping being provided. The first problem concerning a higher production rate differs from the objective problem indicated above, which likewise concerns an increase of productivity, in that stripping is not considered as an obstacle towards increased productivity. The second problem concerning variation of length and shape of bags is of a general nature and is not based on a disadvantage recognised with respect to the transverse sealer according to document D1. Besides, since blousing as defined in claim 1 compensates a disadvantage introduced by stripping, and blousing as such does not lead to a variation of the length of bags or of the shape of bags, the second

problem is one which is not solved by the transverse sealer according to claim 1.

### 3.3 Solution

The objective problem indicated in section 4.2 above is solved according to the subject-matter of claim 1, according to which, in particular, the adjacent path of the sealing units includes a stripping region in which said sealing units serve to strip said film and a sealing region where said sealing units transversely seal said film, said sealing units passing said stripping region immediately before passing said sealing region in said cyclic motion, and a control unit is provided for varying the speed of the sealing means and/or the film delivery speed in the stripping and the sealing regions such that the film delivery speed is greater than the speed of the sealing means in the sealing region (blousing).

Thus according to claim 1 stripping of the tubular film is immediately followed by blousing such that the tubularly formed film is fully expanded, making it easier even for articles with small volume density to fall quickly towards the bottom and fill the bag being produced (column 5, lines 6 to 11).

### 3.4 Obviousness

Document D1 does not mention the problem underlying the patent in suit and also does not give an indication leading towards the solution of this problem according to claim 1.

Document D3 discloses a transverse sealer with sealing means, drive means for delivering the elongated tubular film and a control unit (cf. column 11, line 54 to column 12, line 14).

According to document D3 two distinctive problems are to be solved. The first one is directed towards continuous film delivery and an arbitrary variation of the length of bags and the second one towards a high productivity (column 3, lines 8 to 17).

Both problems are solved separately.

The first problem is solved in that the ratio between the film delivery speed and the speed of the sealing means can be varied accordingly, the speed of the sealing means being equal to or smaller than the film delivery speed as long as the sealing means are in contact with the tubular film (column 3, lines 18 to 30). In context with this solution it is indicated that in case of longer bags being produced blousing can occur, how the speed of the sealing means can be varied to avoid extensive blousing and that minor blousing can be advantageous with respect to the filling of bags (column 3, line 47 to column 4, line 4).

Although, as referred to by the respondent, blousing is mentioned as being advantageous with respect to filling, blousing as disclosed in document D3 is inherent to the proposed variation of speeds enabling an arbitrary variation of the length of bags and thus cannot be regarded independent of its nature as inherent side effect of this variation of the length of bags.

Thus the solution of the first problem does not lead to the subject-matter according to claim 1, according to which blousing is performed at a specific area (sealing region) of the cyclic motion of the sealing units, without a change of the length of bags being effected, to minimise a disadvantage due to stripping.

Considering the solution of the second problem referred to in document D3 it is evident, that this document not only does not lead to the subject-matter of claim 1 but that it leads in a different direction.

The second problem concerns productivity being increased and is thus closer to the problem underlying the patent in suit. This problem is solved in that the film delivery speed is chosen such that it is only slightly less than the speed of the articles being filled into a bag (column 6, lines 11 to 21). To ensure that articles do not remain in the sealing area and that thus a dependable seal is obtained - which according to document D1 and claim 1 of the patent in suit is effected by stripping - document D3 suggests the solution to the second problem referred to above being modified, such that a certain difference is kept between the speed of the articles to be filled into the bag and its film delivery speed (column 6, lines 35 to 41).

Considering both problems and the corresponding solutions disclosed in document D3 in context, in an attempt to solve the problem underlying the patent in suit, the person skilled in the art is thus guided to modify the transverse sealer according to document D1 in that instead of stripping being performed, the film

delivery speed and the speed of the articles to be filled are brought into line.

Finally it neither has been alleged nor proven that document D3 indicates, beyond the disclosure given with respect to the two problems to be solved according to this document and their respective solutions, general technical knowledge, according to which, in a transverse sealer as known from document D1, the introduction of blousing caused for this effect by a variation of the speed of the sealing means and/or the film delivery speed in the sealing region as defined in claim 1 of the patent in suit, minimises the disadvantageous effect of stripping.

Document D4 concerns a bag maker with a transverse sealer having a control unit to control drive units for a pair of sealing units via electronically computed control cams (column 3, lines 16 to 63). The problem underlying this document is to facilitate changes between various modes of operation, relating e.g. to different shapes and length's of the bags.

To solve this problem the drives for film delivery and for the cyclic motion of the sealing means can be coupled such that tubular film is stripped, stretched or bloused (column 1, lines 22 to 43). These effects are solely related to the shape and length of bags, whereas filling of bags, and consequently problems associated therewith, are not addressed. Furthermore no indication is given that the effects enumerated can be combined (cf. e.g. column 3, line 64 to column 4, line 5). Thus document D4, neither considered by itself nor in combination with documents D1 and D3, does not

give an indication leading to the combination of stripping and blousing as defined in claim 1.

The transverse sealer according to claim 1 thus involves an inventive step in the sense of Article 56 EPC.

Claim 10 is directed to a method of operating a transverse sealer comprising a sealing means for transverse sealing, wherein the speed of the sealing means and/or the film delivery speed in the stripping and the sealing regions can be varied as defined in claim 1. The method according to claim 10 thus involves an inventive step for reasons corresponding to the ones given with respect to claim 1.

**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 in amended form on the basis of the following documents:
  - claims 1 to 12 as filed on 30 March 2004
  
  - description: pages 1 to 6 filed on 30 March 2004
  
  - drawings: figures 1 to 10 as granted.

The Registrar:

The Chairman:

D. Magliano

A. Burkhart