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**Datasheet for the decision
of 24 June 2015**

Case Number: T 2175/12 - 3.2.06

Application Number: 03716228.6

Publication Number: 1482888

IPC: A61F13/15, G01N21/84

Language of the proceedings: EN

Title of invention:

PROCESS FOR DETECTION OF MARKED COMPONENTS OF A COMPOSITE
ARTICLE USING INFRARED BLOCKERS

Patent Proprietor:

KIMBERLY-CLARK WORLDWIDE, INC.

Opponent:

THE PROCTER & GAMBLE COMPANY

Headword:

Relevant legal provisions:

EPC Art. 123(2)
EPC 1973 Art. 54, 56, 83
RPBA Art. 13

Keyword:

Amendments - auxiliary requests 2 and 6 - added subject-matter (yes) - auxiliary request 12 - added subject-matter (no)

Sufficiency of disclosure - (yes)

Novelty - (yes) - auxiliary request 12

Inventive step - (yes) - auxiliary request 12

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
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Case Number: T 2175/12 - 3.2.06

**D E C I S I O N
of Technical Board of Appeal 3.2.06
of 24 June 2015**

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
31 July 2012 concerning maintenance of the
European Patent No. 1482888 in amended form.**

Composition of the Board:

Chairman M. Harrison
Members: M. Hannam
M.-B. Tardo-Dino

Summary of Facts and Submissions

- I. An appeal was filed by the appellant (opponent) against the interlocutory decision of the opposition division in which it found that European patent No. 1 482 888 in an amended form met the requirements of the EPC.
- II. The appellant requested that the interlocutory decision be set aside and the patent be revoked.
- III. The respondent (proprietor) requested that the appeal be dismissed, auxiliarily that the patent be maintained in an amended form according to one of auxiliary requests 1 to 7.
- IV. The Board issued a summons to oral proceedings and a communication containing its provisional opinion, in which it indicated that the subject-matter of claim 1 of the main request appeared not to meet the requirement of Article 123(2) EPC. It further stated that the objections under Article 83 EPC appeared not to be justified and *inter alia* that D1 seemingly did not disclose an infrared radiation source.
- V. With letter of 22 May 2015 the respondent filed auxiliary requests 1 to 12, auxiliary requests 8 to 12 being new to the procedure.
- VI. Oral proceedings were held before the Board on 24 June 2015, during which the respondent withdrew the main request, auxiliary request 1, auxiliary requests 3 to 5 and auxiliary requests 7 to 12. It also filed a replacement auxiliary request 12.

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

The respondent requested that the decision under appeal be set aside and the patent be maintained on the basis of one of auxiliary requests 2 or 6 as filed with the letter of 22 May 2015, or auxiliary request 12 filed during the oral proceedings.

VII. Documents cited by the appellant and which are relevant to the present decision are:

D1 US-A-5 359 525;
D2 WO-A-00/40196; and
D6 US-A-6 224 699

VIII. Claim 1 of auxiliary request 2 reads as follows:

"A process of detecting whether one or more components are properly positioned in a disposable absorbent article (204;300;500), the process characterised by: providing an infrared radiation source (202;402,403;602); irradiating the article with infrared radiation emitted from the source (202;402;403;602); producing an image from infrared radiation (206;406) received from the irradiated article (204;300;500); identifying a position of a first variation in the produced image corresponding to an edge position of a first, lower component (304;504) in the article (204;300;500) that underlies a portion of a second, upper component (302;502) in the article; and comparing the identified position with predetermined position data to thereby determine whether the first, lower component (304;504) is properly positioned in the article (204;300;500)."

Claim 1 of auxiliary request 6 reads:

"A process of detecting whether one or more components are properly positioned in a composite article (204;300;500), the process characterised by:
providing an infrared radiation source (202;402,403;602);
irradiating the composite article with infrared radiation emitted from the source (202;402;403;602) having a wavelength in a range of about 700 - 1200nm;
producing an image from infrared radiation (206;406) received from the irradiated article (204;300;500) using an infrared detector;
identifying a position of a first variation in the produced image corresponding to an edge position of a first, lower component (304;504) in the composite article (204;300;500) that underlies a portion of a second, upper component (302;502) in the article; and comparing the identified position with predetermined position data to thereby determine whether the first, lower component (304;504) is properly positioned in the composite article (204;300;500);
wherein the composite article is positioned between the infrared detector and infrared radiation source;
wherein the identified position is a relative position, and wherein comparing includes comparing the identified relative position to predetermined relative position data to thereby determine whether the first component (304;504) is properly positioned in the composite article (204;300;500);
wherein identifying includes identifying a position of a second variation in the produced image corresponding to an edge position of a second component in the composite article, and identifying the position of the first variation in the produced image relative to the position of the second variation; and
wherein the composite article is a disposable absorbent

article."

Claim 1 of auxiliary request 12 reads:

"A process of detecting whether one or more components are properly positioned in a composite article (204;300), the process comprising:
providing an infrared radiation source (202) and an infrared detector (205) operatively connected to an image analyzer (208), which itself is operatively connected to a comparator (210);
positioning the composite article (204;300) between the infrared detector (205) and the radiation source (202);
irradiating the composite article (204;300) with infrared radiation (206) emitted from the source (202) and having a wavelength in a range of about 700 - 1200nm;
producing a two-dimensional image (310) from infrared radiation (206) received from the irradiated composite article (204;300) and transmitted through the composite article (204;300) using the infrared detector (205);
wherein irradiating includes irradiating a first side of the article (204;300) with the infrared radiation, and wherein producing includes producing the image (310) from infrared radiation (206) received from a second, top side of the irradiated article (204;300) opposite the first side; and
wherein the image (310) includes variations therein which correspond to variations in radiation levels received by the infrared detector (205) from the top side of the composite article (204;300);
the process further comprising:
identifying a position of a first variation (314) in the produced image corresponding to an edge position of a first, lower component (304) in the composite article (204;300) that underlies a portion of a second, upper

component (302) in the article using the image analyzer (208); and
comparing the identified position with predetermined position data to thereby determine whether the first, lower component (304) is properly positioned in the composite article (204;300) using the comparator (210); wherein the identified position is a relative position, and wherein comparing includes comparing the identified relative position to predetermined relative position data to thereby determine whether the first component (304) is properly positioned in the composite article (204;300);
wherein identifying includes identifying a position of a second variation (312) in the produced image corresponding to an edge position of the second upper component (302) in the composite article (204;300), and identifying the position of the first variation (314) in the produced image (310) relative to the position of the second variation (312); and
wherein the composite article (204;300) is a disposable absorbent article."

IX. The appellant's arguments may be summarised as follows:

Auxiliary request 2

The subject-matter of claim 1 failed to meet the requirement of Article 123(2) EPC due to addition of the feature 'that underlies a portion of a second, upper component'. This feature was disclosed solely in relation to the 'infrared transmission geometry' system disclosed in Fig. 2 and described on page 5, lines 21 to 31, and in relation to the composite article in Figs. 3A to 3C described on page 8, lines 8 to 31. This embodiment alone enabled the detection of a lower, hidden component in the article and implied complete underlying of a lower component relative to a 'portion'

of an upper component. The Fig. 4 'reflection geometry' system would be unable to detect hidden components (see page 35, lines 4 to 9).

Auxiliary request 6

Objections under Article 123(2) EPC prohibited maintenance of the patent according to this request. Whilst now limited to the 'transmission geometry' embodiment, features technically and functionally related to this embodiment had been omitted from claim 1. These included the image corresponding to variations in radiation levels received by the detector (page 6, lines 19 to 21); the presence of a comparator and the image analyser (see Fig. 2); and the precise manner in which the article was positioned between the infrared detector and infrared radiation source, the wording of claim 1 including an interpretation that the source, article and detector all lay in the plane of the composite article. The feature included at page 8, lines 15 to 17 regarding the upper/lower components partially inhibiting infrared radiation from passing therethrough was also unallowably omitted from claim 1.

Auxiliary request 12

This request should not be admitted as it *prima facie* contravened Article 123(2) EPC. There was no disclosure of 'the' second upper component, claim 5 as granted disclosing solely 'a' second upper component. There was also no basis for the second side of the article being labelled the 'top' side, Fig. 6 showing that the second side panel 502 could equally be labelled the 'bottom' side. This amendment furthermore led to a lack of clarity since the first side was not identified as the 'bottom' side. Fig. 2 furthermore disclosed the detector and source being vertically aligned and directly above and below the article being inspected,

yet this was not reflected in claim 1.

The patent did not meet the requirement of Article 83 EPC because, according to claim 1, the upper component could completely prevent passage of infrared radiation; in such a case, the skilled person would be unable to determine the position of a lower component, such that the invention could not be carried out over the whole scope of the claim. There was also no indication in the patent of suitable materials which partially inhibited passage of infrared radiation, nor of those which transmitted infrared radiation yet were opaque to visible light.

The subject-matter of claim 1 lacked novelty (Article 54 EPC). D1 disclosed a light source, such light source implicitly disclosing light comprising a range of wavelengths and thus including the part of the visible range which intersected with the infrared range. In this respect, white light, with its range of wavelengths, should not be viewed as a general disclosure within which infrared radiation was a specific disclosure. The camera would also be adapted to detect radiation of corresponding wavelength.

The subject-matter of claim 1 lacked an inventive step (Article 56 EPC). Starting from D1, the objective technical problem could be seen as selecting a suitable radiation wavelength. However, no discernible technical effect could be attributed to the use of infrared radiation over visible light and no evidence of such an effect was presented in the patent. The burden of proof that the alleged technical effect was present also lay with the proprietor. It was also not shown that typical components of absorbent articles would be opaque to bright light such that no advantage would be offered

through the use of infrared. There was further no basis for the assumption that materials opaque to visible light would be transparent to infrared; this appeared to be confirmed by the patent disclosing the use of infrared markers, which included dyes, to allow materials to respond to infrared radiation (see [0077] of the patent). The claimed process was also not limited to materials which responded better to exposure to infrared than to visible light, nor to those materials opaque to visible light. Even if it were accepted that a material existed which was opaque to visible light, yet responsive (through partial absorption) to infrared radiation, the use of infrared radiation in component recognition, as an alternative to visible light, was known from both D2 and D6, such that no inventive step was involved.

X. The respondent's arguments may be summarised as follows:

Auxiliary request 2

There was no basis for the conclusion that hidden components were only detectable with the 'transmission geometry' system arrangement. Page 34, lines 33 to 34 stated that the systems of Fig. 2 and Fig. 4 were largely the same and both Figures indicated inspection of the same article 204 which was linked to the training pant 500 on page 36, line 29 and to the absorbent article 300 on page 8, lines 8 to 10. Page 35, lines 4 to 9 also stated that the system of Fig. 4 produced an image from radiation reflected from intermediate or lower components. Page 9, lines 2 to 6 further indicated that the upper and lower components provided a cumulative absorptive and/or reflective effect. Complete underlying was not implied by the expression 'underlies a portion' as shown on page 37, lines 18 to 24.

Auxiliary request 6

Regarding the Article 123(2) EPC objections, radiation levels were already included in claim 1 by way of the first and second variations in the image, there was no need to limit the process claim to the exemplary system particularly since a human operator could equally well perform the comparison and image analysis steps and the skilled person would understand that, in order to detect upper/lower components of the article, the radiation would have to be applied to the planar sides of the article rather than to the side or end edges.

Auxiliary request 12

Regarding the objections made under Article 123(2) EPC, the 'top' side was simply a label applied to the second side of the article. With reference to both Figures 2 and 6, this 'top' side clearly corresponded to the side of the article facing towards the infrared detector. Adoption of the direct vertical alignment of source and detector with the article was unnecessary since Fig. 2 was clearly a schematic arrangement drawing from which such detail would not be extracted by a skilled person. The use of the definite rather than indefinite article with respect to the 'second upper component' had a basis in the application as filed, particularly with reference to the Fig. 3 embodiments as described on page 8, from lines 8 to 31.

The patent met the requirement of Article 83 EPC particularly with reference to the pigmented nonwoven material such as the stretch bonded laminate disclosed in relation to the training pant of the Fig. 5 embodiment.

As regards the novelty objection, D1 failed to

unambiguously disclose that:

- radiation of wavelengths exceeding 700nm were emitted by the light source 62;
- camera 43 could detect radiation of the claimed wavelength; nor that
- the image analyser 46 was suitable for analysing variations in any infrared radiation captured by the detector.

The subject-matter of claim 1 involved an inventive step. The objective technical problem was to be seen as that of allowing the identification of components in a wider range of composite articles. Starting from D1, D2 disclosed only an infrared sensor; no mention was made of the source of infrared radiation which could, therefore, be from heated components as in D6 rather than from an infrared radiation source.

The patent clearly disclosed a technical benefit of using infrared radiation, particularly when components of the composite article were opaque to visible light. This was achieved by the cumulative absorptive effect of multiple components which provided the contrasting images depicted in Figs. 3C and 7. The skilled person also appreciated that absorbent articles were typically not opaque to infrared since materials opaque to infrared were typically metal.

Reasons for the Decision

1. Auxiliary request 2
- 1.1 Article 123(2) EPC

The subject-matter of claim 1 fails to meet the requirement of Article 123(2) EPC.

- 1.2 Claim 1 has been amended relative to claim 1 as originally filed *inter alia* through the feature that the first, lower component in the article 'underlies a portion of a second, upper component in the article'. Whilst this feature has a literal basis on page 8, lines 10 to 13 (all passage references referring to the A-publication of the PCT application), this description passage is part of an embodiment depicted in Figs. 2 and 3A to 3C and described from page 5, line 21 to page 10, line 2. This embodiment relates to an arrangement in which the infrared source and infrared detector are positioned one on each side of the disposable absorbent article being inspected (see Fig. 2), hereafter referred to as an arrangement with 'transmission geometry'. From the process described in this embodiment it is clear that this arrangement is capable of detecting hidden components of the article i.e. those components underlying a portion of an upper component in the article. This is unambiguously shown in Fig. 3C in which the lower component 304 is shown in the image as a darker contrast region 314 despite being 'hidden' below the upper component 302 shown in the image as a lighter contrast region 312 (see page 8, lines 18 to 31).

While a further embodiment in the patent describes a process of detecting correct positioning of components in an absorbent article, this is based on reflection of infrared from the article being inspected (see Fig. 4, page 34, line 31 to page 35, line 13), hereafter referred to as an arrangement with 'reflection geometry'. There is no unambiguous disclosure of this 'reflection geometry' arrangement being able to detect

hidden components in the absorbent article i.e. of being able to detect, in the words of claim 1, 'a lower component in the article that underlies a portion of a second, upper component'; the 'reflection geometry' arrangement is rather only able to detect those components which can be directly irradiated with the infrared radiation.

It thus follows that with the wording regarding detection of a first component underlying 'a portion of a second, upper component in the article' being inextricably linked to the process utilising 'transmission geometry', the omission from claim 1 of details of the 'transmission geometry' arrangement results in claim 1 presenting an unallowable intermediate generalisation of the original disclosure. The subject matter of claim 1 thus does not meet the requirement of Article 123(2) EPC.

- 1.3 The respondent's argument regarding the 'transmission geometry' not being inextricably linked to the detection of hidden components is not persuasive.
- 1.3.1 The cross-references in the patent linking the exemplary systems according to Fig. 2 and Fig. 4 are not specific enough to unambiguously extract that the 'reflection geometry' arrangement of Fig. 4 is also capable of detecting hidden components. For example, page 34, line 33 onwards, on which the respondent *inter alia* relies, simply states that 'the system of Fig. 4 is largely the same as that of Fig. 2, except that the radiation source ... has been ... positioned ... on a same side of the composite article as the infrared detector'. This simply identifies that the system detects reflected infrared radiation from the inspected article, rather than transmitted radiation, but further

similarities with the Fig. 2 system, particularly regarding what the system of Fig. 4 is able to detect, cannot be inferred. The fact that both Fig. 2 and Fig. 4 indicate the absorbent article being inspected with the common reference sign 204 whilst being linked to the absorbent article 300 and the training pant 500 also provide no further indication that the 'reflective geometry' arrangement can detect hidden components beneath the upper component of the article.

1.3.2 The passage of the description on page 35, lines 6 to 9 identifies that 'infrared radiation received by the detector from the top side of the composite article ... may be reflected from intermediate or lower components of the composite article'. Contrary to the opinion of the respondent, this does not unambiguously imply that the intermediate or lower components of the article which reflect the infrared radiation are hidden beneath an upper component. An equally technically plausible reading is that the upper component is smaller in area than the intermediate or lower components which allows a direct reflection of infrared from these components to be detected without their being hidden below an upper component. The Board furthermore sees this as the more plausible reading of this description passage since it is not unambiguously to be understood from the patent that infrared radiation could penetrate an upper component and subsequently be reflected from the surface of an underlying component back through the upper component in a manner enabling a clear indication of the lower component's edge position to be detected above the surface of the article.

1.3.3 The disclosed cumulative absorptive and/or reflective effect disclosed on page 9, lines 2 to 6 also fails to persuade the Board that this is a disclosure supporting

the idea that hidden components would be detected with the 'reflective geometry' arrangement. The above description passage is taken from the detailed description of how the 'transmission geometry' arrangement of Fig. 2 produces the image of Fig. 3C. In the paragraph bridging pages 8 and 9, the infrared radiation is said to pass through the lower component 304 before being partially absorbed or reflected by the upper component 302. Merely because a reflective effect is mentioned, this does not imply that the skilled person is presented with a disclosure of the image of Figure 3(c) being something which would be obtained with the reflective geometry arrangement; this section merely explains that some of the radiation may be reflected and evidently such radiation cannot then be absorbed. In the case of absorption, this can indeed be understood since cumulative infrared absorption by the lower component and the portion of the upper component overlying the lower component will clearly result in the darker region 314 in the image of Fig. 3C. For this reason the cumulative absorptive and/or reflective effect mentioned in line 4 of page 9 can be understood only unambiguously to have been disclosed in relation to the absorptive geometry arrangement.

1.4 The subject-matter of claim 1 thus fails to meet the requirement of Article 123(2) EPC with the consequence that auxiliary request 2 is not allowable.

2. Auxiliary request 6

2.1 Article 123(2) EPC

The subject-matter of claim 1 does not meet the requirement of Article 123(2) EPC.

2.2 Claim 1 of this request has been restricted to aspects of the 'transmission geometry' embodiment of the invention described from page 5, line 21 to page 10, line 2. Nonetheless its subject-matter represents an unallowable intermediate generalisation of this embodiment due to the following features inextricably disclosed in combination with the features relating to the 'transmission geometry' having been omitted from claim 1:

- variations in radiation levels and/or wavelengths of the infrared radiation received by the detector;
 - the presence of an image analyzer and a comparator;
- and
- a first side of the article is irradiated with the infrared radiation and the radiation received to produce the image is emitted from a second side opposite the first side.

Regarding the first omitted feature from claim 1, the sole unambiguous disclosure of producing an image from the infrared radiation received from the composite article is on page 6, lines 19 to 23, which disclosure further specifies that the image includes variations in radiation levels and/or wavelengths of the infrared radiation received by the detector.

As regards the second omitted feature from claim 1, the only unambiguous disclosure of the way in which the process functions (see Fig. 2 and page 5, lines 29 to 31) includes both an image analyzer and a comparator.

For the third omitted feature from claim 1, the embodiment of Fig. 2 includes a very specific arrangement of the infrared source and detector relative to the composite article, which is also found in claim 5 as originally filed.

The omission of these features from claim 1 thus contravenes Article 123(2) EPC.

2.3 Regarding the first omitted feature and the respondent's argument that varying radiation levels are implicitly included in claim 1, this is not convincing. While claim 1 does indeed include features directed to first and second variations in the produced image, there is no suggestion from these features that the variations comprise varying radiation levels. Contrarily to this lack in the claim, page 6, lines 19 to 23, from which passage the detail of the image analysis is taken, identifies that image variations '... correspond to variations in radiation levels (and/or wavelengths) received by the infrared detector ...'. These features regarding variations in radiation levels / wavelengths are thus disclosed in a manner inextricably linked with the image analysis carried out by the image analyzer such that omission of these features from claim 1 results in an unallowable intermediate generalisation contravening Article 123(2) EPC.

2.4 As regards the second omitted feature, the respondent's argument that it was only an exemplary embodiment which disclosed image analyzer and comparator devices, was not able to persuade that these were not required in claim 1. Indeed page 5, lines 21 to 31 in combination with Fig. 2 unambiguously show that the 'transmission geometry' embodiment includes both an image analyzer and a comparator. This is not simply an exemplary embodiment of the claimed process but rather the embodiment from which features directed to the 'transmission geometry' arrangement are taken for inclusion in claim 1. The omission of these features

from claim 1, which aims to restrict to this particular embodiment, thus contravenes Article 123(2) EPC. The respondent's further argument that an operator could equally well study the image and provide the required comparative analysis, whereby no analyser and comparator were then required, however lacks any basis in the application as filed. There is also no evidence on file demonstrating that visual analysis of the image would indeed provide the comparative information required.

2.5 The third feature omitted from claim, contrarily to the respondent's arguments that clearly only the upper and lower sides of the composite article are intended, does not unambiguously imply just this reading of the claim. Indeed, an infrared radiation source and a radiation detector both located in the plane of the composite article is covered by the wording defining the claimed process; the composite article simply needs to be positioned between the infrared detector and the infrared radiation source in claim 1. It is further noted that the composite article is not restricted to an essentially two-dimensional article such that locating the source and detector in the plane of the composite article would not be a technically unrealistic reading of the claim. It thus follows that the omission of the features concerning the disclosure as to how the composite article is positioned between the infrared detector and the infrared radiation source leads to an unallowable intermediate generalisation of the specific disclosure as originally filed.

2.6 Whilst not decisive for this request, the Board notes here that the feature included at page 8, lines 15 to 17 regarding the upper/lower components partially inhibiting infrared radiation from passing therethrough

is not explicitly required in claim 1 since this feature is implicitly included in the claimed process. For the claimed process to be able to identify a first variation in the produced image, the upper and lower components must at least partially affect the free passage of infrared radiation; if this were not the case, there would be no contrast in the images depicted, e.g. as in Figs. 3C and 7. The feature is thus implicitly present in claim 1.

2.7 From points 2.2 to 2.5 above, the Board finds that the subject-matter of claim 1 fails to meet the requirement of Article 123(2) EPC. Auxiliary request 6 is thus not allowable.

3. Auxiliary request 12

3.1 Admittance of request - Article 13 Rules of Procedure of the Boards of Appeal (RPBA)

3.1.1 In appeal proceedings, the Rules of Procedure of the Boards of Appeal apply. Article 12(2) RPBA specifies that the statement of grounds of appeal and reply must contain the party's complete case. After filing the grounds of appeal or reply, any amendment to a party's case may be admitted and considered at the Board's discretion, which is set out in Article 13 RPBA, such discretion being exercised in view of the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy.

3.1.2 The respondent filed auxiliary request 12 during oral proceedings. The request thus represented a change to the respondent's complete case as defined in Article 12(2) RPBA) and its admittance is to be considered at

the Board's discretion under Article 13 RPBA.

- 3.1.3 Whilst filed only during the oral proceedings, auxiliary request 12 was based on the previous auxiliary request 12 filed with letter of 22 May 2015, including amendments reflecting the conclusions reached with respect to the higher ranking requests discussed during oral proceedings. As such, the new subject-matter of claim 1 can not be regarded as particularly complex, it including features discussed at length with respect to previous requests. Auxiliary request 12 could also not realistically have been filed sooner since the exact reasoning on which some of the objections under Article 123(2) EPC were based had been expanded on for the first time during oral proceedings (e.g. the possible interpretation of the infrared source, composite article and detector all lying in the same plane of the article).
- 3.1.4 As is established case law of the Boards of Appeal, procedural economy implies that amended requests should at least be *prima facie* allowable in order to be admitted. The Board finds that the request meets the requirement of Article 123(2) EPC and Article 84 EPC 1973.
- 3.1.5 The inclusion of the word 'top' in the expression 'a second, top side of the irradiated article' in claim 1 is interpreted simply as a label or designation of the side of the article facing the detector. The word is used on page 6, line 22 of the description in the claimed context of the second side of the article's relation to the infrared detector and is consistent with the depiction of the system in Fig. 2. It also corresponds with the arrangement depicted in Fig. 6 in which the 'top' side is again that side facing the

detector (see sentence bridging pages 36 and 37), even though a second detector may be placed on the lower side of the arrangement in Fig. 6, as disclosed on page 36, line 30 to page 37, line 2; in which case the outermost side of the composite article at the lower position of the drum would be that corresponding to the defined 'top'. It is further noted that the inclusion of the word 'top' obviated the interpretation that the article was exposed to infrared radiation from one of the side edges of the article.

- 3.1.6 The inclusion of the word 'top' with respect to the second side of the composite article does not introduce a lack of clarity regarding the lack of the word 'bottom' with respect to the first side of the article, or the use of the terms 'upper' and 'lower' already in the claim. The second 'top' side is claimed to be 'opposite the first side' such that arrangement of the two sides with respect to one another is unambiguously clear (Article 84 EPC 1973).
- 3.1.7 The use of the definite article 'the' rather than the indefinite article 'a' in the expression 'corresponding to an edge position of 'the' second, upper component (302)' in the second to last feature of claim 1 is appropriate given the prior recitation in claim 1 of 'a second upper component'. It is also unambiguously disclosed that the composite article itself comprises both an upper and lower component (see Fig. 3A and page 8, lines 10 to 13) such that there is no doubt that the claimed upper component is part of the composite article rather than a separate entity.
- 3.1.8 The Board further finds that there is no requirement to include the infrared source and detector being (vertically) directly above and below the composite

article in claim 1. Fig. 2, on which the appellant relied as a basis for its argument in this respect, would be understood by a skilled person to represent a schematic depiction of the system arrangement relative to the composite article. The skilled person would thus regard the depicted vertically aligned directly above and below relationship as being merely indicative and not an inextricably technically and functionally linked limiting feature of the disclosed system arrangement.

3.1.9 The Board thus finds that auxiliary request 12 meets the requirements of Article 84 EPC 1973 and Article 123(2) EPC and thus that procedural economy is not adversely affected by the admittance of this request. The new subject-matter was also found not to be of unreasonable complexity to be dealt with at oral proceedings, particularly since the features added were features which had been discussed in detail in relation to existing requests. The Board thus exercised its discretion under Article 13 RPBA to admit this request into the proceedings.

3.2 Article 83 EPC 1973

Auxiliary request 12 is found to meet the requirements of Article 83 EPC 1973.

3.2.1 The appellant's argument that the invention could not be carried out when the upper component completely prevented passage of infrared radiation is not accepted. From the depicted image of Fig. 3C in combination with the description in paragraph [0014] of the patent, the skilled person would appreciate that an upper component entirely opaque to infrared radiation would indeed provide no meaningful image allowing correct positioning of components in a composite

article to be detected. The skilled person would thus understand that such an upper component opaque to infrared radiation is not included as a meaningful embodiment of the invention and would thus not be hindered from carrying out the invention over its full scope, in which the upper component implicitly does not completely prevent the passage of infrared radiation.

3.2.2 As regards the appellant's further objections under Article 83 EPC 1973 concerning materials which block visible light and those which partially transmit infrared radiation, these are also not convincing. Paragraph [0073] of the patent discloses side panels formed of non-woven material such as a stretch bonded laminate which, through reference to Fig. 5 at the start of the paragraph, can clearly be used in the 'transmission geometry' arrangement allowing detection of the edge portion of a lower hidden component with absorbed infrared radiation. Such a non-woven material would thus be understood by the skilled person as exemplifying the advantages of the invention, i.e. allowing detection of the edges of lower components even when the upper component is opaque to light.

3.2.3 The appellant's arguments thus fail to convince that the invention is not disclosed in a manner sufficiently clear and complete for it to be carried out. The Board thus finds that auxiliary request 12 meets the requirements of Article 83 EPC 1973.

3.3 Novelty

The subject-matter of claim 1 is found to meet the requirement of Article 54 EPC 1973.

3.3.1 D1 discloses the following features of claim 1, the reference signs in parentheses referring to D1:

A process of detecting whether one or more components are properly positioned in a composite article (see Fig. 3), the process comprising:
providing a (light) source (62) and a (light) detector (43) operatively connected to an image analyzer (46), which itself is operatively connected to a comparator (71);
positioning the composite article between (see Fig. 3) the detector (43) and the (light) source (62);
exposing the composite article to (light) emitted from the source (see col. 6, lines 59 to 61);
producing a two-dimensional image from light received from the composite article (col. 5, lines 54 to 58) and transmitted through the composite article using the detector;
wherein exposing includes exposing a first side of the article with the light (col. 6, line 55) and wherein producing includes producing the image from light received from a second, top side of the exposed article opposite the first side (col. 6, lines 56 to 57); and
wherein the image includes variations therein which correspond to variations in light levels received by the detector from the top side of the composite article (col. 6, lines 18 to 20);
the process further comprising:
identifying a position of a first variation in the produced image corresponding to an edge position of a first, lower component in the composite article that underlies a portion of a second, upper component in the article (col. 5, lines 54 to 59; col. 6, lines 16 to 23) using the image analyzer (46); and
comparing the identified position with predetermined position data to thereby determine whether the first,

lower component is properly positioned in the composite article using the comparator (col. 6, lines 24 to 28); wherein the identified position is a relative position (col. 5, lines 62 to 68), and wherein comparing includes comparing the identified relative position to predetermined relative position data to thereby determine whether the first component is properly positioned in the composite article; wherein identifying includes identifying a position of a second variation in the produced image corresponding to an edge position of a second upper component in the composite article, and identifying the position of the first variation in the produced image relative to the position of the second variation (col. 5, lines 62 to 68); and wherein the composite article is a disposable absorbent article (col. 4, lines 16 to 21).

- 3.3.2 The subject-matter of claim 1 differs from D1 through:
- providing an infrared radiation source and an infrared detector;
 - the infrared radiation having a wavelength in a range of about 700 - 1200nm; and
 - the image analyzer being capable of detecting variations in infrared radiation.
- 3.3.3 The appellant's contention that the backlighting source 62 of D1 also emits infrared radiation is not unambiguously disclosed. The backlighting source 62 is not specified any further, such that the specific nature of the light emitted is unknown. The appellant contends that it would be a 'white light' source, which comprises a range of wavelengths including also infrared wavelengths. That it is a white light source is mere conjecture; an alternative light source could be an LED which would emit light of a very limited

range of wavelengths, certainly not including infrared wavelengths. It thus follows that there is no unambiguous disclosure of infrared radiation being emitted by the backlighting source 62 in D1. The claimed wavelength range is also specific to infrared radiation such that this is also not known from D1.

3.3.4 The appellant's argument that the detector (camera 43 of D1) would detect infrared radiation emitted by the source is also unconvincing due to the backlighting source 62 of D1 not unambiguously emitting any infrared radiation. With no infrared radiation to detect, the camera 43 of D1 would not necessarily be configured to be able to detect such radiation and even if it could detect this (depending on the type of camera), there is no indication that the image analyzer is configured to detect any variations in the infrared wavelengths.

3.3.5 It thus follows that the subject-matter of claim 1 is novel over D1. With no further documents having been cited against the novelty of claim 1, the Board finds that the subject-matter of claim 1 is novel over the cited art (Article 54 EPC 1973).

3.4 Inventive step

The subject-matter of claim 1 involves an inventive step (Article 56 EPC 1973).

3.4.1 As identified in point 3.3.2 above, the subject-matter of claim 1 differs from D1, which is seen by both parties as presenting the most promising starting point, through:

- providing an infrared radiation source and an infrared detector;
- the infrared radiation having a wavelength in a range

of about 700 - 1200nm; and
- the image analyzer being capable of detecting variations in infrared radiation.

These differentiating features allow hidden components in lower layers of a composite article to be detected even if the layers are opaque to visible light. The objective technical problem to be solved may thus be formulated as to enable detection of hidden components in a wider array of articles, including in opaque articles.

- 3.4.2 The skilled person would find no guidance in documents D2 or D6 nor from his general knowledge to suggest modifying the process known from D1 in order to reach the claimed subject-matter whilst solving the objective problem.

D2 discloses an automatic inspection system for an absorbent article manufacturing apparatus (see Fig. 1). The inspection system comprises strobe lights 57A, 57B which illuminate a web from below, cameras 38, 40 capturing an image above the web. Alternative methods for detecting a parameter in the absorbent article of D2 include infrared sensors (see page 7, line 39). D2 is however silent on how such infrared sensors may be arranged in the inspection system; there is in particular no disclosure of a source of infrared radiation and where this might be placed, such that the infrared sensors mentioned in D2 could be arranged simply to detect infrared radiation emitted from the inspected web due to the temperature of components of the web (see e.g. the explanation given below for D6 in this regard). D2 thus provides the skilled person with no hint on how to modify the process disclosed in D1 in order to reach the claimed subject-matter.

D6 discloses a system for sensing assembly quality characteristics of composite articles on a production line (see Fig. 1). Infrared sensor 80 is positioned above the web to detect infrared radiation emitted from discrete areas of the web (col. 9, lines 53 to 63) related to different temperatures of web elements (col. 10, lines 15 to 22). It is thus apparent that D6 also fails to disclose a source of infrared radiation, such that it cannot be considered to provide the skilled person with a hint as to how to modify D1 in order to reach the subject-matter of claim 1.

3.4.3 The objective technical problem formulated by the appellant, namely to select a suitable radiation wavelength, appears not to be truly objective insofar as it is too specific and guides the skilled person to part of the solution of claim 1 regarding the range of radiation wavelength to be utilised. Nonetheless, even faced with this technical problem, the skilled person would still not be guided to the claimed solution since, as identified in 3.4.2 above, neither D2 nor D6 guide the skilled person to providing an infrared radiation source in order to inspect the composite articles.

3.4.4 The appellant's argument that the invention as claimed lacked a technical effect over the use of a visible light source was not accepted. The appellant failed to provide evidence of its contention, yet the onus for proof of such an allegation clearly lay with the appellant where a plausible technical effect is disclosed in the patent. Such a technical effect is indeed disclosed in the present patent with the problem as regards components opaque to visible light discussed in paragraph [0004] and the advantage of using infrared

radiation described in paragraph [0017] with respect to Figs. 3A to 3C. The alleged lacking technical effect is thus not accepted.

3.4.5 Claim 1 is not limited to materials which respond better to exposure to infrared radiation than to visible light, which the appellant argued again showed that no technical effect was achieved through the use of infrared radiation. The Board refutes this view particularly since, as identified in 3.4.4 above, the patent provides sufficient indication of advantages associated with using infrared radiation over visible light. It is fully plausible, given the type of products which are to be inspected (i.e. disposable absorbent articles) and the materials of same, that the process of claim 1 can be used for both materials opaque to visible light and those transparent to visible light with the same success; a restriction to just those materials opaque to visible light is thus not necessary, whereby the objective problem has been found to be correctly defined as enabling detection of hidden components in a 'wider' array of articles.

3.4.6 Regarding the appellant's contention that the patent failed to show absorbent articles being opaque to bright visible light and that infrared thus offered no advantage, this is not accepted by the Board. The patent provides guidance as to materials with which the invention can be utilised (see paragraph [0073]) and it furthermore seems fully plausible that absorbent articles with an absorbent core would be substantially opaque to even bright visible light. With the achieved image contrast being of importance for accurately detecting correct positioning of components, infrared radiation can technically plausibly achieve better contrast than visible light in a composite article

which is substantially opaque.

3.4.7 The appellant also provided no evidence supporting its contention that materials opaque to visible light would not necessarily be transparent to infrared radiation. As identified in points 3.4.4 and 3.4.6 above, the patent plausibly discloses the advantage of using infrared radiation when materials are opaque to visible light, such that the existence of such materials is accepted. With no evidence provided to counter this, the Board sees no reason to doubt the disclosure of the patent.

3.4.8 The appellant's reference to infrared markers, including dyes, to allow materials to respond to infrared radiation, changes nothing in this regard. The introduction of such markers is detailed in paragraph [0065] of the patent, where they are introduced to a desired component for which a position is to be ascertained relative to another unmarked component. The infrared marker (or blocker) is thus introduced to enhance the contrast between the component so marked and the unmarked component with which a relative position is to be determined. The use of infrared markers (or blockers) does not unambiguously imply that components not so marked do not absorb infrared radiation to a degree sufficient to be detected. Further, while the use of dyes in absorbent articles is commonplace for aesthetic reasons, there is no reason to assume that such 'aesthetic' dyes have any discernible infrared marking or blocking characteristics.

3.4.9 The appellant has thus been unable to provide convincing reasons why the subject-matter of claim 1 is rendered obvious when starting from D1 and combining

this with the technical teaching of D2 or D6. The subject-matter of claim 1 is thus found to involve an inventive step (Article 56 EPC 1973).

3.4.10 The description was brought into conformity with the amended claim of auxiliary request 12. To these amendments the appellant had no objections.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of:
 - auxiliary request 12 comprising claim 1 as filed during the oral proceedings,
 - description: pages 2, 2a, 2b, 3, 4, 9, 11, 13, 14, 15, 16 and 17 filed during the oral proceedings,
 - description : pages 5, 6, 7, 8, 10, 12 as granted,
 - figures as granted.

The Registrar:

The Chairman:



M. H. A. Patin

M. Harrison

Decision electronically authenticated