

**OPINION UNDER SECTION 74A**

Patent	EP 2493701 B1
Proprietor(s)	De La Rue International Limited
Exclusive Licensee	
Requester	Lincoln IP Limited
Observer(s)	De La Rue International Limited
Date Opinion issued	31 October 2016

**The request**

1. The comptroller has been requested by Lincoln IP Limited (“the requester”) to issue an opinion as to whether patent EP 2493701 B1 (“the patent”) is valid in light of the following documents:  
  
D1: WO 2008/043981  
  
D2: Australian Patent Office Opposition Decision [2015] APO 77  
  
D3: US 5766738  
  
D4: CA 2032587  
  
D5: Optical Document Security, Third Edition, Rudolf L. van Renesse, Artech House, 2005, in particular Chapter 1 and Chapter 7.
2. The requester has argued that the claims of the patent lack an inventive step in light of the disclosure of D1.
3. The claims of corresponding Australian Patent Application No. 2010311176 were found to lack an inventive step on light of D1. The independent claims of the patent and the corresponding Australian application are identical. D2 is a copy of the opposition decision.

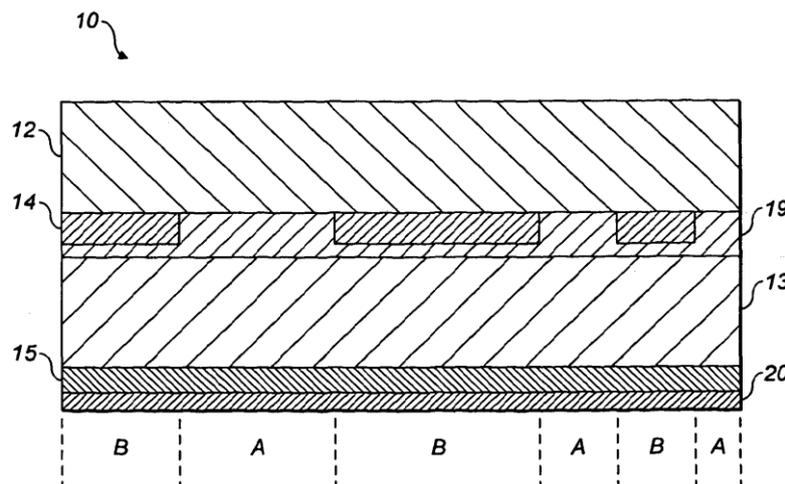
**Observations and Observation in reply**

4. Observations were received from Boulton Wade Tennant on behalf of the proprietor, De La Rue International Limited (“the observer”). The observations include argument

refuting the allegation of lack of validity along with a copy of the Written Opinion of the International Search Authority issued in respect of PCT/GB2010/002008 from which the patent derives. The Written Opinion concludes that independent claims 1 and 2 are novel and inventive over GB 2442711. D1 claims priority from GB 2442711 and has substantially the same description. Observations in reply were received from the requester.

## The Patent

5. The patent, EP 2493701 B1, is titled “Security Device”. It has a priority date of 30<sup>th</sup> October 2009. It was published on 5<sup>th</sup> September 2012 and was granted on 10<sup>th</sup> September 2014. The patent remains in force.
6. The patent relates to security devices that can be used in various authenticating or security applications, and in particular to an optically variable security device utilising multiple colour shift layers.
7. According to the patent the increasing popularity of colour photocopiers and other imaging systems and the improving technical quality of colour photocopies has led to an increase in the counterfeiting of banknotes, passports and identification cards and the like. It goes on to note that there is a need to add additional authenticating or security features to existing security features. In particular, it suggests that there is a demand to introduce features which are discernible by the naked eye but which are “invisible” to, or viewed differently, by a photocopier. Since a photocopying process typically involves scattering high-energy light off an original document containing the image to be copied, one solution would be to incorporate one or more features into the document which have a different perception in reflected and transmitted light.

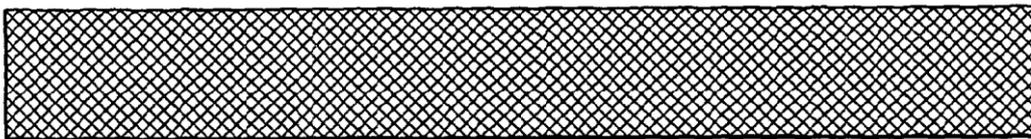


**FIG. 2a**

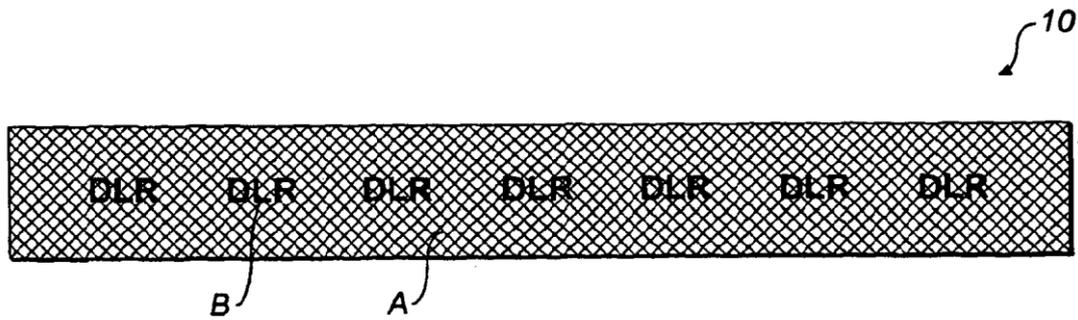
8. The patent provides an optically variable security device that has a distinctive and easily recognisable colourshifting security feature. With reference to figure 2a of the patent the security device 10 has a first colourshifting layer 12, a second colourshifting layer 13, a partial first light absorbing layer 14 and a second light absorbing layer 15. The partial first light absorbing layer is formed between the first

surfaces of the colourshifting layers.

9. The colour of the partial first light absorbing layer 14 is selected to substantially match the colour of light reflected at a normal angle of incidence by the combination of second colourshifting layer 13 and a second light absorbing layer 15.
10. The application of a partial absorbing layer 14 between the two colourshifting layers 12, 13 creates two optically variable regions, Regions A and B. In region A there is no absorbing layer between the two colourshifting layers 12,13 such that the wavelength of reflected light, at any given angle of incidence, is a result of the additive mixing of the individual wavelengths of light reflected from the two colourshifting layers 12,13.
11. In region B there is an absorbing layer 14 between the two multilayer films 12, 13 and the wavelength of reflected light, at any given angle of incidence, is solely the reflected light from the second multilayer film 13 as influenced by the colour of the underlying regions of the partial absorbing layer 14.
12. The operation of the device can be considered from the following example where layer 12 exhibits a green to blue colourshift, layer 13 exhibits a red to green colourshift and the partial absorbing layer 14 is red. At a normal angle of incidence region A will appear yellow from the combination of green (layer 12) and red (layer 13). Region B will also appear yellow from the combination of green (layer 12) and red (absorbing layer 14). Thus the security device 10 will have a uniform yellow appearance at normal incidence.
13. However, when the security device 10 is tilted at an angle away from normal, (i.e. the viewing angle is changed away from normal incidence) , the first colourshifting layer 12 now reflects blue light, which will appear as magenta in regions B when viewed over the underlying regions of the red absorbing layer 14. The second colourshifting layer 15 reflects green light, so the regions A will appear cyan as a result of the additive mixing of the individual wavelengths of the blue and green light reflected from the two colourshifting layers 12,13 respectively.
14. The effect of this is that the security device 10 has a latent security feature that is not visible when the device is viewed at a normal angle of incidence. However a plurality of magenta regions B corresponding to the partial absorbing layer 14 will become visible in a cyan background when the device is viewed at an angle to the normal . A plan view of a typical security device is shown in Figures 2b and 2c reproduced below:



**FIG. 2b**



**FIG. 2c**

15. In the example given above the partial absorbing layer 14 forms the characters "DLR" (region B) and the background is provided by region A. When viewing at normal incidence regions A and B appear yellow and the characters "DLR" are hidden. On changing the viewing angle away from normal incidence the "DLR" characters change from yellow to magenta and the background region changes from yellow to cyan resulting in the revealing of the "DLR" characters.
16. The patent has nineteen claims including two independent claims – claims 1 and 2. Claim 1 reads as follows:

*A security device comprising:  
 a first colourshifting layer,  
 a second colourshifting layer which exhibits different reflective characteristics to the first colourshifting layer,  
 said colourshifting layers exhibiting a visible colour at normal incidence,  
 a partial first light absorbing layer between first surfaces of the first and second colourshifting layers and a second light absorbing layer applied to a second surface of the second colourshifting layer,  
 wherein the colour of the partial first absorbing layer is selected to substantially match the colour of light reflected at a normal angle of incidence by the combination of the second colourshifting layer and the second absorbing layer.*

Claim 2 reads as follows:

*A security device comprising:  
 a first colourshifting layer,  
 a second colourshifting layer which exhibits different reflective characteristics to the first colourshifting layer,  
 said second colourshifting layer being a multilayer polymer,  
 a partial first light absorbing layer between first surfaces of the first and second colourshifting layers and a second light absorbing layer applied to a second surface of the second colourshifting layer,  
 wherein the colour of the partial first absorbing layer is selected to substantially match the colour of light reflected at a normal angle of incidence by the combination of the second colourshifting layer and the second absorbing layer.*

17. The requester has helpfully divided independent claims 1 and 2 into a number of

features for ease of analysis as follows:

Claim 1:

Feature No.	Feature
1	A security device comprising:
2	a first colourshifting layer
3	a second colourshifting layer which exhibits different reflective characteristics to the first colourshifting layer,
4	said colourshifting layers exhibiting a visible colour at normal incidence,
5	a partial first light absorbing layer between first surfaces of the first and second colourshifting layers
6	and a second light absorbing layer applied to a second surface of the second colourshifting layer,
7	wherein the colour of the partial first absorbing layer is selected to substantially match the colour of light reflected at a normal angle of incidence by the combination of the second colourshifting layer and the second absorbing layer.

Claim 2:

Feature No.	Feature
1	A security device comprising:
2	a first colourshifting layer
3	a second colourshifting layer which exhibits different reflective characteristics to the first colourshifting layer,
4	said second colourshifting layer being a multilayer polymer,
5	a partial first light absorbing layer between first surfaces of the first and second colourshifting layers
6	and a second light absorbing layer applied to a second surface of the second colourshifting layer,
7	wherein the colour of the partial first absorbing layer is selected to substantially match the colour of light reflected at a normal angle of incidence by the combination of the second colourshifting layer and the second absorbing layer.

The only difference between claims 1 and 2 is feature 4.

### Claim construction

- Before considering the documents put forward in the request I will need to construe the claims of the patent following the well known authority on claim construction which is *Kirin-Amgen and others v Hoechst Marion Roussel Limited and others* [2005] RPC 9. This requires that I put a purposive construction on the claims, interpret it in the light of the description and drawings as instructed by Section 125(1) and take account of the Protocol to Article 69 of the EPC. Simply put, I must decide

what a person skilled in the art would have understood the patentee to have used the language of the claim to mean.

19. Section 125(1) of the Act states that:

*For the purposes of this Act an invention for a patent for which an application has been made or for which a patent has been granted shall, unless the context otherwise requires, be taken to be that specified in a claim of the specification of the application or patent, as the case may be, as interpreted by the description and any drawings contained in that specification, and the extent of the protection conferred by a patent or application for a patent shall be determined accordingly.*

20. And the Protocol on the Interpretation of Article 69 of the EPC (which corresponds to section 125(1) ) states that:

*Article 69 should not be interpreted in the sense that the extent of the protection conferred by a European patent is to be understood as that defined by the strict, literal meaning of the wording used in the claims, the description and drawings being employed only for the purpose of resolving an ambiguity found in the claims. Neither should it be interpreted in the sense that the claims serve only as a guideline and that the actual protection conferred may extend to what, from a consideration of the description and drawings by a person skilled in the art, the patentee has contemplated. On the contrary, it is to be interpreted as defining a position between these extremes which combines a fair protection for the patentee with a reasonable degree of certainty for third parties.*

21. Neither the requester nor the observer has provided any argument relating to the construction of the claims.
22. I am satisfied that a person skilled in the art would have no difficulty in construing the scope of the claims.

### **Do claims 1 and 2 lack an inventive step in light of D1?**

23. To determine whether or not an invention defined in a particular claim is inventive over the prior art, I will rely on the principles established in *Pozzoli SPA v BDMO SA* [2007] EWCA Civ 588, in which the well known Windsurfing steps were reformulated:

*(1)(a) Identify the notional “person skilled in the art”;*  
*(1)(b) Identify the relevant common general knowledge of that person;*  
*(2) Identify the inventive concept of the claim in question or if that cannot readily be done, construe it;*  
*(3) Identify what, if any, differences exist between the matter cited as forming part of the “state of the art” and the inventive concept of the claim or the claim as construed;*  
*(4) Viewed without any knowledge of the alleged invention as claimed, determine whether those differences constitute steps which would have been obvious to the person skilled in the art.*

### **(1)(a) Person skilled in the art**

24. The requester has defined the skilled person as one skilled in optically variable effects and their application to security devices. The observer does not dispute this and therefore I am content to accept this definition.

### **(1)(b) Common general knowledge**

25. In Raychem Corp's Patents [1998] RPC 31 Laddie J explained common general knowledge as follows:

*"The common general knowledge is the technical background of the notional man in the art against which the prior art must be considered. This is not limited to material he has memorized and has at the front of his mind. It includes all that material in the field he is working in which he knows exists, which he would refer to as a matter of course if he cannot remember it and which he understands is generally regarded as sufficiently reliable to use as a foundation for further work or to help understand the pleaded prior art. This does not mean that everything on the shelf which is capable of being referred to without difficulty is common general knowledge nor does it mean that every word in a common text book is either. In the case of standard textbooks, it is likely that all or most of the main text will be common general knowledge. In many cases common general knowledge will include or be reflected in readily available trade literature which a man in the art would be expected to have at his elbow and regard as basic reliable information."*

26. The requester argues that the skilled person would be aware of D5 as it is a renowned desk reference on optical document security and thus would form part of the common general knowledge of the person skilled in the art at the priority date of the patent. The observer has provided no evidence to refute the assertion that D5 is a renowned desk reference.
27. I am content to accept that D5 would form part of the common general knowledge of the person skilled in the art. D5 discusses colour theory, the mixing of liquid crystals, colour shifting effects based on angle of observation and in particular, colour shift effects with reference to liquid crystals and multilayer films.
28. The requester further asserts that D3 and D4 form part of the common general knowledge of the person skilled in the art. Both documents disclose a device having a similar optical effect as the device described in the patent i.e. a device that has a single colour when viewed at normal incidence but which changes colour on tilting to reveal a hidden image.
29. With regard to D3 and D4 the statement by Sachs LJ in General Tire & Rubber Co v Firestone Tyre & Rubber Co Ltd [1972] RPC 457 is of particular interest because it sets out the relationship of patent specifications to the common general knowledge ("it is clear that individual patent specifications and their contents do not normally form part of the relevant common general knowledge"). With regard to patent specifications Sachs LJ explained:

*"...it is clear that individual patent specifications and their contents do not*

*normally form part of the relevant common general knowledge, though there may be specifications which are so well known amongst those versed in the art that upon evidence of that state of affairs they form part of such knowledge, and also there may occasionally be particular industries (such as that of colour photography) in which the evidence may show that all specifications form part of the relevant knowledge.”*

30. I have no evidence before which suggests either D3 or D4 to be patent specifications falling into the categories discussed above by Sachs LJ and thus forming part of the common general knowledge.
31. The requester also argues that the skilled person would be familiar with the use of liquid crystal materials and multilayer polymer films in optical security devices. In light of the disclosure in the patent and the prior art referenced therein, I agree with the requester on this point.

## **(2) Inventive concept of claims 1 and 2**

32. The requester has defined the inventive concept of claims 1 and 2 as follows:

*“...the provision of a device having a hidden image at a normal angle of incidence but which image is revealed upon tilting the device away from a normal angle of incidence. This effect is specifically produced by substantially matching the colour of the partial first absorbing layer with the colour of the light reflected at a normal angle of incidence by the combination of the second colourshifting layer and the second absorbing layer.”*

33. The observer has not provided any argument disagreeing with this definition. I am satisfied with this definition of the inventive concept of claims 1 and 2.

## **The disclosure of D1**

34. Before identifying any differences between D1 and the inventive concept of claims 1 and 2 I will need to consider the disclosure of D1. Referring to Figure 5 of D1 (reproduced below) there is disclosed a security device 10 comprising a carrier strip 17, an all over absorbing layer 15 and a first optically variable liquid crystal layer 12 (colour shifting layer) which is applied all over the absorbing layer 15. A further absorbing layer 14 is partially applied on top of the first liquid crystal layer 12. A second liquid crystal layer 13 (colour shifting layer) is applied over the partial absorbing layer 14 and the exposed regions of the first liquid crystal layer 12.

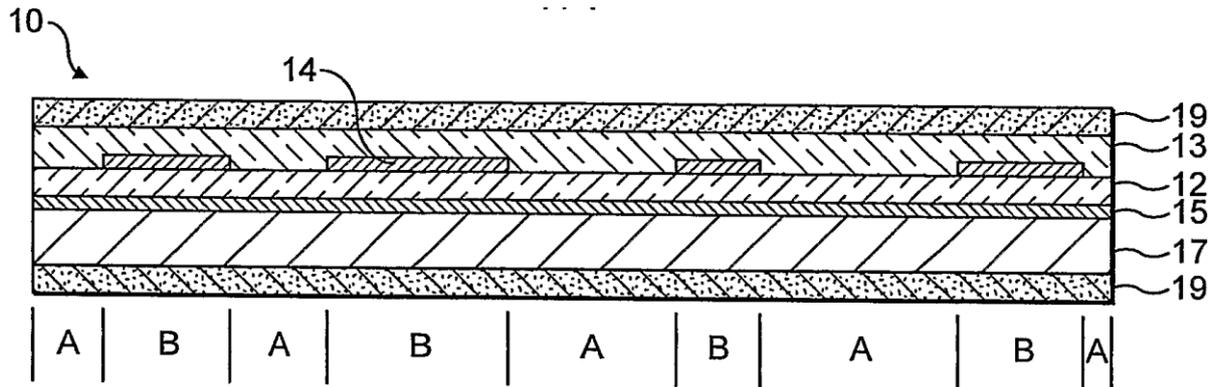


FIG. 5

35. When comparing Figure 5 of D1 with Figure 2a of the patent (reproduced on page 2 above) it can be seen that the device of Figure 5 of D1 is structurally identical to the device of Figure 2a of the patent with regard to colour shifting and absorbing layers.
36. In the initial request, the requester discusses three embodiments of D1 which are considered relevant. The closest of these in my opinion is that referred to in the request as embodiment B. In this embodiment the device 10 has regions A and B of a single colour when viewed at normal incidence whereas the regions have different colours when the device is tilted. Therefore the device has a hidden image at a normal angle of incidence which is revealed upon tilting of the device. Figures 12a and 12b of D1 are reproduced below:

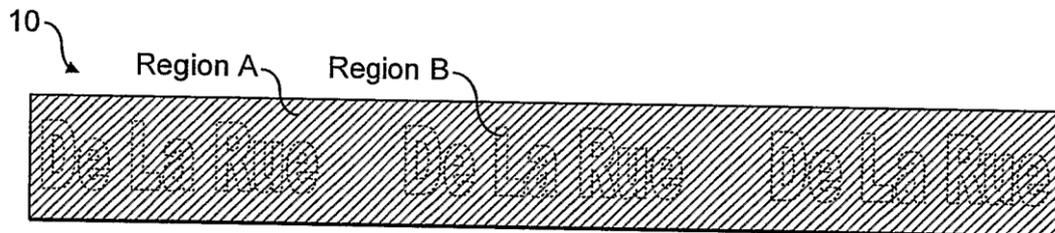


FIG. 12a

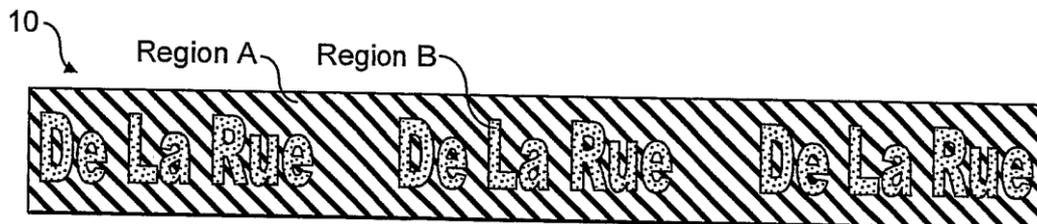


FIG. 12b

37. In the embodiment of Figures 12a and 12b the first liquid crystal layer 12 reflects

light in the infrared region of the electromagnetic spectrum when at normal incidence (Figure 12a) , appearing colourless and transparent, and reflects red light when tilted away from normal incidence (Figure 12b) . The second liquid crystal layer 13 exhibits a red-green colourshift when viewed against a dark absorbing background. Regions A and B are defined by the partial dark absorbing layer 14 between the two liquid crystal layers 12, 13 which, in this example, is applied in the form of alphanumeric characters such that Region B is a repeating pattern of the words DE LA RUE and Region A is the background. When viewed in reflection and at normal incidence both Regions A and B will appear red due to the transparent colourless appearance of the first liquid crystal layer 12 having no visible effect on the appearance of the device 10. On tilting the device 10, such that it is viewed away from normal incidence, Region A appears yellow due to the additive colour mixing from the red reflected light from the first liquid crystal layer 12 and the green reflected light from the second liquid crystal layer 13. Region B appears green due to the reflected light coming solely from the second liquid crystal layer 13. To the authenticator the device 10 appears uniformly red at normal incidence but on tilting away from normal incidence the repeating legend DE LA RUE appears in a yellow colour against a green background.

38. There is also disclosed a modified version of embodiment B in which the repeating legend DE LA RUE appears in a red colour against a magenta background at normal incidence, but on tilting away from normal incidence DE LA RUE disappears and the device 10 switches to a uniform green appearance. This is opposite to embodiment B and the inventive concept of the patent which has a uniform appearance at normal incidence and which reveals an image on tilting. In the modified version the uniform appearance is achieved by the first liquid crystal layer 12 comprising a liquid crystal film that reflects blue light when viewed at normal incidence, and reflects ultra-violet light, appearing colourless and transparent, when tilted away from normal incidence.

### **(3) What differences exist between the matter of D1 and the inventive concept of claim 1?**

39. From the arguments submitted it would appear to be accepted by both parties that D1 discloses all of features F1-F6 of claim 1. Where the parties disagree is on F7.

40. F7 requires:

*“wherein the colour of the partial first absorbing layer is selected to substantially match the colour of light reflected at a normal angle of incidence by the combination of the second colourshifting layer and the second absorbing layer.”*

41. The purpose of matching the colour of the layers as required by F7 is to provide a single uniform colour across the device when viewed at a normal angle of incidence thereby “hiding” the image that appears when the device is tilted.
42. In embodiment B of D1 the second colourshifting layer 12 appears colourless and transparent at normal incidence. Thus, the combination of the second absorbing layer 15 and the second colourshifting layer 12 is simply the colour of the second absorbing layer 15. As the first partial absorbing layer 14 is dark (black) and the second absorbing layer 15 is also dark (black) they match. There has to be a match

between the colour of the partial first absorbing layer and the combination of the second colourshifting layer and the second absorbing layer in order to produce the uniform appearance shown above in Figure 12a of D1. Therefore, in my opinion D1 discloses F7.

43. The modified version discloses the colour matching of the combination of layers as required by F7 but at an angle tilted away from the normal angle of incidence and not at the normal angle of incidence as required by F7.
44. D1 teaches the skilled person in both embodiment B and the modified version that a uniform appearance can be obtained through use of a colourshifting layer that is colourless and transparent at a certain angle of incidence. The clear appearance of the colourshifting layer provides matching of the colour of the partial first absorbing layer with the colour of the combination of the second colourshifting layer and the second absorbing layer.
45. Neither embodiment B nor the modified version disclose F4 in my opinion. F4 requires:

*“said colourshifting layers exhibiting a visible colour at normal incidence”*

46. Embodiment B discloses colourshifting layer 12 being colourless and transparent when viewed at a normal angle of incidence.
47. The modified version discloses colourshifting layer 12 being blue when viewed at normal incidence. However, this is when the regions A and B are of different appearance, thus revealing the image. The modified version does not disclose the colourshifting layers exhibiting a visible colour when the device has a uniform appearance i.e. when the combination of layers match as required by F7. Therefore, in my opinion the modified version does not disclose F4.
48. Would it be obvious on the basis of D1 to have the transparent and colourless colourshifting layer in embodiment B or the modified version exhibit a visible colour at normal incidence?
49. The requester has identified the following passage bridging pages 12 and 13 of D1 as providing support for the argument that the partial absorbing layer 14 may be of a different colour other than dark (black):

*“Whilst the use of a black, or very dark, substantially totally absorbing layer may give rise to the most strong colourshift effects, other effects may be generated by the use of a partially absorbing layer 14 of other colours or a combination of colours, giving rise to differing apparent colourshift colours. The use of different coloured partially absorbing layers 14 enables the number of optically variable regions to be increased further. The absorbing layers 14, 15 of the present invention may comprise a pigmented ink or coating or alternatively a non-pigmented absorbing dye can be used.”*

50. The observer has argued that this paragraph points away from the invention as it only teaches the use of non-black coloured absorbing material for the purpose of increasing the number of coloured regions available, whereas claims 1 and 2 require

selecting the colour of the absorbing material to produce a uniform single coloured region. Therefore, it is argued, the skilled person would have no motivation to modify the teaching of D1.

51. The requester counters that the second sentence in the paragraph above is not a limitation on the first. Rather it is merely a narrower embodiment of the use of coloured partially absorbing layers. I agree with the requester in this respect. I consider the paragraph to be teaching that “other effects may be generated by the use of a partially absorbing layer 14 of other colours or a combination of colours, giving rise to differing apparent colourshift colours”. Therefore, the skilled person would consider the use of a different colour other than black for the partially absorbing layer in order to generate differing apparent colourshift colours.
52. Embodiment B teaches a device having a hidden image at a normal angle of incidence but which image is revealed upon tilting the device away from a normal angle of incidence. This effect is specifically produced by substantially matching the colour of the partial first absorbing layer 14 with the colour of the light reflected at a normal angle of incidence by the combination of the second colourshifting layer 12 and the second absorbing layer 15 as discussed above.
53. The skilled person would fully understand that in order to obtain the uniform appearance at a normal angle of incidence in embodiment B the combination of colour reflected by the second colourshifting layer 12 and the second absorbing layer 15 has to match the colour of the partial first absorbing layer 14.
54. Hence starting with either embodiment B or the modified embodiment the skilled person would be able to arrive at the invention set out in claim 1 without any invention. Therefore, I consider claim 1 to lack an inventive step in light of D1.

### **(3) What differences exist between the matter of D1 and the inventive concept of claim 2?**

55. Claim 2 differs from claim 1 in respect of F4. Further D1 does not disclose F4 of claim 2 namely that the second colourshifting layer is a “multilayer polymer”.
56. The requester argues that multilayer polymers are technical equivalents to liquid crystals and the skilled person would consider this a routine substitution. The observer has not provided any argument refuting this.
57. From the evidence before me, I agree with the requester that multilayer polymers are technical equivalents to liquid crystals. In my opinion, a person skilled in the art would consider replacing the liquid crystal layer in D1 with a multilayer polymer layer as a matter of routine substitution. Therefore, I consider independent claim 2 to lack an inventive step in light of D1.

### **Dependent claims**

58. The requester argues that dependent claims 3-19 lack an inventive step in light of D1. The observer has provided no argument regarding the dependent claims.

59. I find myself in agreement with the argument put forward by the requester that dependent claims 3-19 lack an inventive step in light of D1.

### **Conclusion**

60. I consider that the invention as defined by claims 1-19 lacks an inventive step in light of D1.

### **Application for review**

61. Under section 74B and rule 98, the proprietor may, within three months of the date of issue of this opinion, apply to the comptroller for a review of the opinion.

Marc Collins  
Examiner

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### **NOTE**

*This opinion is not based on the outcome of fully litigated proceedings. Rather, it is based on whatever material the persons requesting the opinion and filing observations have chosen to put before the Office.*