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(54) **Smoking article wrapper with reduced ignition propensity**

(57) The present invention relates to a smoking article wrapper with reduced ignition propensity. Specifically the present invention relates to a wrapper for a smoking article comprising regions of one or more additives applied to its surface which regions have reduced porosity

and/or reduced oxygen diffusion sufficient to reduce the ignition propensity of a smoking article and regions having substantially reduced additive such that the wrapper maintains its physical integrity during processing and provides a wrapper with improved visual appearance by reducing wrinkling.

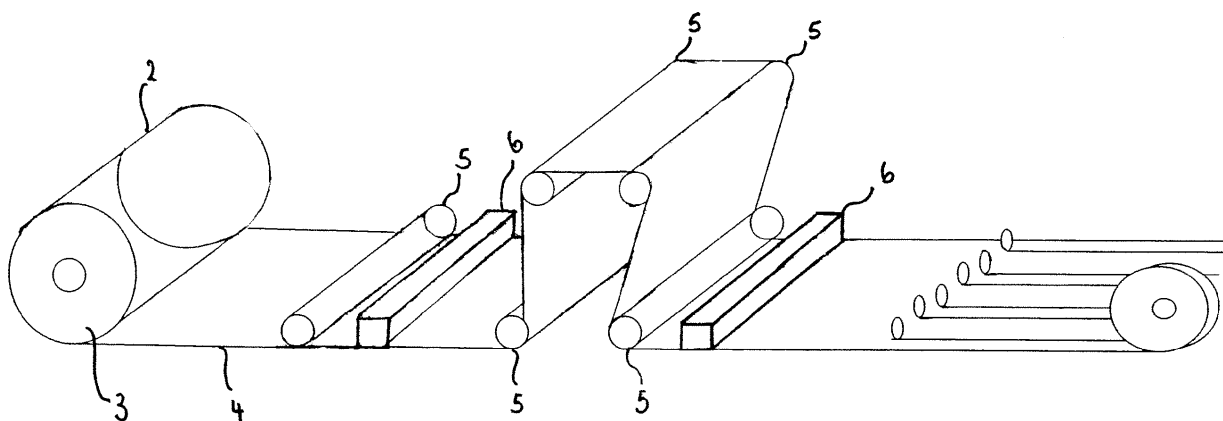


FIGURE 1

Description

[0001] The present invention relates to a wrapper for a smoking article and a smoking article wrapper comprising the wrapper.

[0002] There have been attempts to design smoking articles that extinguish when inadvertently left unattended on a substrate. A "low ignition propensity" smoking article is one that has been designed to be less likely than a conventional cigarette to ignite soft furnishings such as a couch or mattress. Ideally, a low ignition propensity smoking article will continue to burn when freely suspended such as in the holder of an ashtray or when being held in the hand without puffing ("free burn"). The tendency for a cigarette to go out during free burn is referred to as "self extinguishment".

[0003] Attempts have been made in the art to produce a smoking article with reduced ignition propensity by designing a smoking article wrapper with rings of reduced porosity and/or reduced diffusion of oxygen. The rings are applied to the wrapper by a printing an additive or combination of additives as bands on to a "jumbo" roll of a preformed cigarette base wrapper. Typically, the additive is applied with an aqueous or non-aqueous liquid carrier which evaporates from the wrapper once the additive has been delivered.

[0004] It is necessary to apply the additives in sufficient quantities in order to achieve the required reduction in porosity and/or oxygen diffusion. However, there are limitations to the amount of additive that may be present in the carrier system such that generally the required additive loading on to the wrapper is achieved by over-wetting the wrapper with the carrier system comprising the additive.

[0005] The physical parameters of the wrapper, such as tensile strength, burst strength, elongation and stretch, need to be preserved in order for the wrapper to maintain its integrity when transported through the printing process. However, over wetting of the base wrapper by the addition of carrier liquids during the printing process has a detrimental effect on the physical properties of the wrapper, for example, by reducing its tensile strength which in turn causes breakages within its structure. As a result, the printing process needs to be stopped from time to time when the wrapper breaks in order to repair or replace the base wrapper which is time consuming and expensive.

[0006] Furthermore, the use of liquid carrier systems can be detrimental to the visual finish of the wrapper and hence the finished smoking article. For example, wetting a cigarette wrapper can lead to "cockling", an effect whereby the surface of the wrapper undergoes a cycle of expansion and contraction due to uptake and removal of the liquid carrier causing it to become uneven or wrinkled.

[0007] The aim of the present invention is to overcome the problems associated with the prior art wrappers. In particular, an aim of the present invention is to provide a

wrapper for a smoking article with acceptable self-extinguishment and low ignition propensity characteristics, but which is capable of withstanding the manufacturing process by maintaining its physical integrity and to provide a wrapper which has acceptable visual characteristics when applied to the final smoking article.

[0008] In a first aspect, the present invention provides A wrapper for a smoking article comprising regions of one or more additives applied to its surface which regions have reduced porosity and/or reduced oxygen diffusion sufficient to reduce the ignition propensity of a smoking article and regions having substantially reduced additive such that the wrapper maintains its physical integrity during processing and provides a wrapper with improved visual appearance by reducing wrinkling..

[0009] In a second aspect the present invention provides a smoking article comprising a wrapper according to the present invention.

[0010] The term "wrapper for a smoking article" is to be understood in a broad sense. A typical example is a cigarette paper. Another example is a tobacco roll wrapper. Further examples include a cigar having a wrapper, a cigarillo and a fine-cut tobacco unit wrapper used to produce a smoking article from roll your own and make your own tobaccos.

[0011] The term "machine direction" is understood to mean in the direction through which the wrapper passes during the processing steps including unwinding, application of additive, slitting and formation of the smoking article.

[0012] The term "cross direction" is understood to mean perpendicular to the machine direction through which the wrapper passes during application of additive.

[0013] The wrapper is supplied from a storage roll, a so called jumbo-roll and may be machined to form the final wrapper which is included in the smoking article. The wrapper supplied from the storage roll may have a width of up to a few meters. The width of the base wrapper may be 26.75mm which corresponds to the circumference of a typical cigarette plus the width of the gluing seam of the wrapper. Such a jumbo roll may be cut after the additive is applied to the required dimensions for incorporation in to the smoking article.

[0014] The wrapper also covers individual smoking papers. Such papers are used by consumers who make ("roll") their cigarettes from a supply of tobacco and individual rolling papers provided in a booklet containing folded and interleaved rolling paper sheets.

[0015] The wrapper may be manufactured in a typical smoking article rod making machine adapted to enable the discontinuous printing of the additive on to the surface of the wrapper. Generally, existing commercial smoking rod making machines may be equipped with the necessary means to carry out the present invention by the inclusion of one or more printing stations and associated drying equipment between the supply bobbins and the rod making unit.

[0016] The wrapper may have additive applied to its

surface by any printing method typically used in the field. Preferably, gravure printing is used which allows for a much higher level of printing quality. It is possible to print large block areas of colour uniformly in contrast to conventional letter press or flexography printing. Gravure printing may be used on line in the printing process.

[0017] The wrapper has additive applied to its surface at a print station within a printing machine. The wrapper has additive applied as a series of discontinuous lines in the cross direction to form areas of applied additive and areas of substantially reduced additive. The complete pattern of additive can be applied at a single print station or applied at two or more print stations within a single printing machine. Alternatively, multiple pass printing may be used. Preferably, the surface pattern of the wrapper is formed during a single pass through the printing machine whereby multiple print stations each produce one or more discontinuous lines of areas of applied additive on the surface of the wrapper in the machine direction simultaneously such that multiple discontinuous lines are printed on to the base wrapper in a single pass.

[0018] Where multiple print stations are used, each station applies additive to only part of the base wrapper with the sum of the applications from the individual print stations equalling the complete pattern of additive over the base wrapper. In the single pass embodiment where multiple print stations are used, each print station is spaced apart across the machine direction of the wrapper such that the physical properties of the wrapper may be sufficiently restored after passing through one print station and drying station before further additive is applied to the base wrapper by the next print station. Thus, during the entire printing process the average physical properties of the wrapper are maintained to enable effective and efficient processing.

[0019] The wrapper typically has additive applied to its surface as two or more discontinuous lines such that the applied regions of additive from adjacent discontinuous lines are arranged in columns in the machine direction of the wrapper and spaced apart with regions of substantially reduced additive. In the cross direction the regions of applied additive may be aligned across the width of the base wrapper. In an alternative embodiment, the applied regions of additive may be offset from adjacent applied regions of additive to form a staggered pattern. The extent of this offset between adjacent applied regions of additive and in totality can be further optimised to maximise the residual physical properties of the wrapper.

[0020] Preferably, the wrapper comprises one or more discontinuous lines of additive offset at an angle perpendicular to the machine direction of the jumbo roll. Preferably the regions of print additive may be offset at an angle of up to 15° from perpendicular to the machine direction. More preferably the angle of offset is up to 10° and most preferably it is 5°. This can be beneficial in improving the durability of print rollers used in the print stations. When direct Gravure printing is used excess liquid carrier may be removed from the surface the printing roller by means

of a doctor blade, running essentially perpendicular to the machine direction. Cross direction printing patterns typically used to produce wrapper having leading and trailing edges coincident with the doctor blade. The pressure exerted by the doctor blade effectively reduces cylinder life. By offsetting the leading and trailing edges of the printing pattern relative to the doctor blade, wear can be reduced and the cylinder life extended. The angle and direction of offset may be varied between discrete regions of printing or be consistent throughout the total printing pattern.

[0021] In the cross direction of the wrapper, the regions of applied additive typically have a width corresponding to width of the final wrapper used to produce the smoking article or multiples thereof. Therefore when the jumbo wrapper is machined down to widths typically employed in the manufacture of smoking articles, the regions of applied additive from continuous transverse sections across this width. Hence when the wrapper is formed into the cigarette the additive region forms a continuous ring. More preferably the widths of these regions in the cross direction correspond to only the circumference of a smoking article excluding overlap; hence the region of the final wrapper used to form the overlap in the smoking article is left essentially unprinted. The width of the regions of reduced additive are typically up to a maximum of twice the overlap width of the wrapper incorporated in to the final smoking article. The overlap seam in a smoking article typically comprises two layers of the wrapper held together by an adhesive; the addition of an additive to this overlap region does not significantly reduce the permeability or oxygen diffusibility and hence does not significantly alter ignition propensity characteristics of the cigarette. In this preferred embodiment, when the wrapper is formed into a smoking article, the additive region forms a continuous ring around the circumference of the smoking article except the overlap region thereby maintaining the desired ignition propensity characteristics.

[0022] In the machine direction of the paper the regions of applied additive are generally from 4 to 12mm wide. Preferably the regions of applied additive are 5–10mm wide, and most preferably 6–9mm wide. Preferably, the regions of reduced additive in the machine direction are generally less than 30 mm wide, more preferably from 10 to 30mm wide. Most preferably the regions of reduced additive are 18–20 mm wide.

[0023] The wrapper has continuous regions of reduced or zero additive in both the machine and cross directions by virtue of discontinuous printing of additive. As these areas have little carrier liquid applied to them, the physical properties remain similar to the original jumbo roll wrapper. Thus the printed wrapper may be considered as a continuous mesh of unprinted wrapper with isolated regions of additive. While the physical properties of the printed regions may be reduced, overall the wrapper retains its integrity through the residual mesh of unprinted base wrapper. In addition, the discontinuous nature of the printed areas will hinder the linear propagation of any

tears within the paper and reduce the effect of cockling.

[0024] The additive may be applied to the wrapper in a single pass or multiple pass process. Two or more discontinuous lines of additive may be added simultaneously to the wrapper by a single pass of the wrapper through a print station. Preferably, two or more discontinuous lines of additive may be printed on to the wrapper sequentially by multiple passes of the wrapper through a print station whereupon after each pass a single line of additive is printed on to the wrapper.

[0025] The additives may be applied to the wrapper in a liquid carrier. Preferably the liquid carrier is in the form of a solution, suspension, emulsion or combination thereof. Preferably the liquid carrier is aqueous, non-aqueous or a combination thereof and may contain emulsifying agent depending on the nature of the additives.

[0026] In one embodiment, a suspension of additive may be applied within an aqueous carrier. The aqueous carrier penetrates the wrapper transporting the additive into the matrix of the wrapper. Once the carrier evaporates, the additive is left within the wrapper matrix where it can reduce the porosity and/or oxygen diffusability either before or during the burning of the smoking article. Once applied to the wrapper the liquid carrier is allowed to evaporate allowing the wrapper to dry and for the additive to set within the matrix of the wrapper.

[0027] The surface of the wrapper may be heated by an external heat source to aid the evaporation process evaporation process or it may be allowed to occur naturally. Preferably the external heat source is selected from heated contact rollers, hot air drying, microwave drying, radio frequency drying, infrared lamps and combinations thereof.

[0028] The external heat source may be positioned at any point along the length of the wrapper as it is processed. Preferably, in the embodiment where multiple print stations are used, a heat source is provided between adjacent print stations. The wrapper is allowed to dry after application of the additive in the liquid carrier from a first print station before further additive is applied from a second print station. This configuration is advantageous since it allows the integrity of the wrapper to be maintained after addition of additive by the first print station before being processed by the second print station.

[0029] The additives applied to the wrapper may be any of those used in the art to reduce the ignition propensity of smoking articles. Preferably, the additive is selected from alginates, acetates, polyvinyl alcohols and polyvinyl acetates including partially hydrolysed derivatives and co-polymers, modified and unmodified starches, cellulose derivatives such as carboxy-methyl cellulose, ethyl-cellulose, hydroxymethyl-cellulose. Preferably the additive further contains inorganic ions such as phosphate, mono or divalent metal salts, silicas, and other agents known in the art to modify burn rate and combinations thereof.

[0030] Following addition of the additive, the wrapper is machined to produce a wrapper which may be incor-

porated into the smoking article.

[0031] Following is a description by way of example only, with reference to the accompanying drawings, of method of putting the invention in to effect, wherein

Figure 1 is a schematic drawing of a standard machine for printing additive on to cigarette wrappers to which the method of the present invention may be carried out;

Figure 2 is a schematic drawing of three consecutive print stations and associated heat sources;

Figure 3 is a schematic drawing of a jumbo wrapper having multiple discontinuous lines of printed additive regions applied obtainable by a method of the present which is slit to making widths of wrapper;

Figure 4 is an alternative jumbo wrapper obtainable by a method of the present invention; and

Figure 5 is a further alternative jumbo wrapper obtainable by a method of the present invention.

Figures 6a and 6b is a graph of the distribution of additive loading levels in the cross direction of the wrapper;

Figure 7 is a graph of an alternative distribution of additive loading levels in the cross direction of the wrapper;

Figure 8 is a graph of a further alternative distribution of additive loading levels in the cross direction of the wrapper;

Figure 9 is a schematic drawing of a final wrapper showing the additive pattern and the wrapper incorporated in to a smoking article with annular rings of additive expect in the overlap region.

[0032] A typical printing machine 1 comprises a compartment 2 for holding a jumbo roll 3 of wrapper 4, a series of rollers 5 and a series of print stations 6. In use, the leading edge of the jumbo roll 3 is fed through the rollers 5 such that the jumbo roll 3 is unwound. Additive is applied to the surface of the wrapper as it passes through the each print station 6.

[0033] The printing machine comprises multiple printing stations 6 arranged along the length of the unwound wrapper 4. As the wrapper 4 passes through the first printing station additive is applied to the surface of the wrapper 4 to form discontinuous lines running in the cross direction of the wrapper such that regions of additive 7 are formed on the surface of the wrapper 4 interspersed with regions of reduced or no additive 8. As the wrapper 4 passes through a second print station further discontinuous lines of additive are simultaneously applied to

the surface of the wrapper adjacent to the first set of discontinuous lines across the machine direction of the wrapper 4. Multiple lines may be sequentially printed on to the surface of the wrapper across its machine direction axis by passing through consecutive print stations 6.

[0034] A heat source 9 is positioned between adjacent printing stations 6 such that when the wrapper 4 emerges from a print station it passes through the heat source 9 and the liquid carrier in which the additive is loaded evaporates from the surface of the wrapper 4. As a result, the integrity of the wrapper 4 is maintained before it enters the next print station and further liquid carrier is applied to its surface.

[0035] A paper according to a first aspect of the present invention is shown in Figure 3. The additive is printed on to the surface of the wrapper 4 such that adjacent discontinuous lines running across the machine direction axis of the wrapper form columns of regions of additive in the cross direction across wrapper 7 surrounded by regions of reduced or no additive 8. Thus within a column of printing in the machine direction, the printing pattern remains consistent with that required for reduced ignition propensity performance. The printed regions of additive 7 have dimensions of 4–12mm width whilst the regions of reduced or no additive 8 are 10–30mm wide.

[0036] After the wrapper 4 emerges from the printing machine 6 with the additive printed on to its surface it is machined to form an individual wrapper 13 which is incorporated in to the final smoking article 14. Each column of region of printed additive plus its surrounding envelope may be cut in the machine direction at 11 (parallel to wrapper edge 10) and 12 by a slitting machine to form an individual wrapper as shown in figure 3. The wrapper making width has multiple continuous additive lines across its width with unprinted edges 15. Although a continuous pattern is not formed across the jumbo roll 3, by rolling the individual wrapper 13 into a cylinder when incorporating it into the final smoking article an essentially continuous printing region sufficient to form a ring on the smoking article 14 having reduced porosity and/or oxygen diffusion is formed as shown in figure 9.

[0037] Wrappers according to alternative embodiments of the invention are shown in Figures 4 and 5. In the first alternative embodiment the printing stations 6 and the printing patterns within each station are configured such that the columns of regions of additive 7 formed in the machine direction by printing multiple series of discontinuous lines are offset between adjacent columns. In the second alternative embodiment, the printing stations and the printing patterns within each station 6 are arranged such that the regions of additive 7 are printed on to the surface of the wrapper at an angle of up to 15° from the perpendicular to the machine direction.

[0038] Alternatively double width bobbins or double bobbins may be machined from the source jumbo in the machine direction and these can then be further machined to yield individual wrappers at the smoking article or cigarette making machine as would be typical in cur-

rently available machinery

[0039] The distribution of additive loading levels in the cross direction of the base wrapper 4 may be constant in a region of applied additive 7 as shown in Figure 6a such that there is no additive applied at the outermost edges of the individual wrapper 13 when the wrapper 4 is slit. This distribution of additive loading is repeated cyclically in the cross direction of the wrapper 4 at each region of applied additive 7. In alternative embodiments, as shown in figures 6a and 7, the additive may be applied in increasing concentration in the cross direction of the wrapper 4 to a maximum level such that the region of applied additive 7 has maximum concentration of additive in an area at the centre of the individual wrapper 13 when the wrapper 4 is slit. In a still further embodiment, the additive loading level in the cross direction may be concentrated in a smaller region of applied additive 7 at the centre of the wrapper 13 when the wrapper 4 is slit.

[0040] The use of discontinuous printing of additive and multiple print stations 6 interspersed with heating sources allows the wrapper 4 to maintain its physical integrity during processing. The printing process is therefore not interrupted to repair any tears that may appear in the wrapper due to over wetting when applying the additive. In addition, as the wrapper 4 is generally less wet during the process of the invention compared to prior art methods, the wrapper does not experience "cockling" and the final smoking article has an improved appearance. Hence the complete process of taking a width of base paper, printing discontinuous regions of additive, drying, machining to wrapper width and forming smoking articles can be integrated into a sequential or on-line process by the suitable modification of currently existing cigarette making machinery

Claims

1. A wrapper for a smoking article comprising regions of one or more additives applied to its surface which regions have reduced porosity and/or reduced oxygen diffusion sufficient to reduce the ignition propensity of a smoking article and regions having substantially reduced additive such that the wrapper maintains its physical integrity during processing and provides a wrapper with improved visual appearance by reducing wrinkling.
2. A wrapper of claim 1 selected from a cigarette paper, a cigar wrapper, a cigarillo wrapper, a fine-cut tobacco unit wrapper, unsmokable tobacco roll wrapper and a cigarette filter tube wrapper.
3. The wrapper of claim 1 or claim 2 wherein said regions of one or more additives are formed by discontinuous application of the one or more additives in one or more lines across the surface of the wrapper.

4. The wrapper of any preceding claim wherein two or more discontinuous lines of additive are applied to the surface of the wrapper simultaneously in a single pass of the wrapper through one or more printing stations or sequentially by multiple passes. 5
5. The wrapper of claim 4 wherein one or more drying stations are positioned between adjacent print stations to dry the applied additive. 10
6. The wrapper of any preceding claim wherein two or more discontinuous lines of additive are printed on to the surface of the wrapper in the cross direction across the wrapper such that the applied regions of additive from adjacent lines are arranged in columns in the machine direction across the wrapper and spaced apart with regions of substantially reduced or zero additive. 15
7. The wrapper of claim 6 wherein the applied regions of additive are offset across the cross direction axis of the wrapper from the applied regions of additive of an adjacent discontinuous line. 20
8. The wrapper of any preceding claim wherein the additive is applied to the wrapper in a discontinuous line at an angle of up to 15° from the cross direction axis of the wrapper. 25
9. The wrapper of any preceding claim wherein the regions of applied additive correspond to the circumference of the smoking article or the circumference of the smoking article less the side seam overlap in the cross direction. 30
10. The wrapper of claim 9 wherein the regions of applied additive are from 4 to 12 mm wide and the regions of substantially reduced additive between adjacent lines of applied additive is from 10 to 30 mm wide in the machine direction. 35
11. The wrapper of any preceding claim wherein the additive is applied to the wrapper by a printing process selected from Gravure, off-set Gravure, flexography or intaglio printing. 40
12. The wrapper of any preceding claim where in the additive is selected from the group consisting of vinyl alcohols, vinyl acetates including partially hydrolysed derivatives, their homo-polymers and co-polymers, alginates, modified and unmodified starch, cellulose and its derivatives such as, carboxymethylcellulose, ethyl-cellulose and hydroxypropyl-cellulose, natural or synthetic waxes, inorganic ions and combinations thereof. 45
13. The wrapper of claim 13 wherein the additive further comprises inorganic phosphate, mono or divalent metal salt, silica, burn retardants or combinations thereof. 50
14. The wrapper of any preceding claim wherein the additive is provided within a liquid carrier. 55
15. A smoking article comprising a wrapper according to any preceding claim.

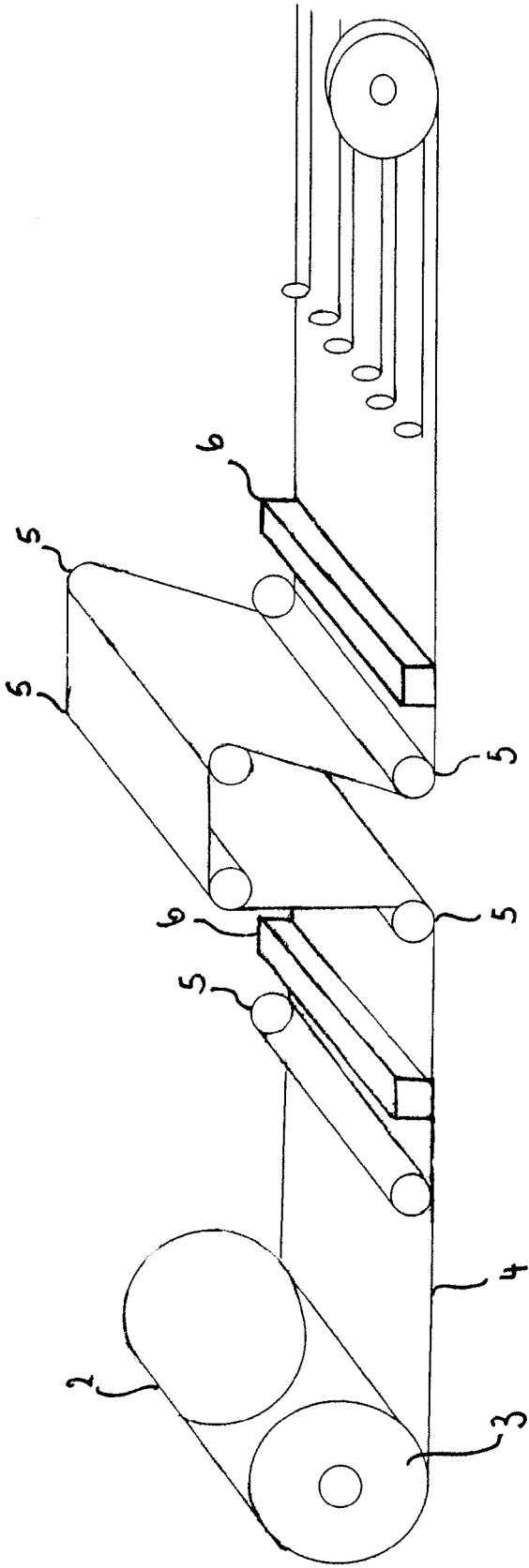


FIGURE 1

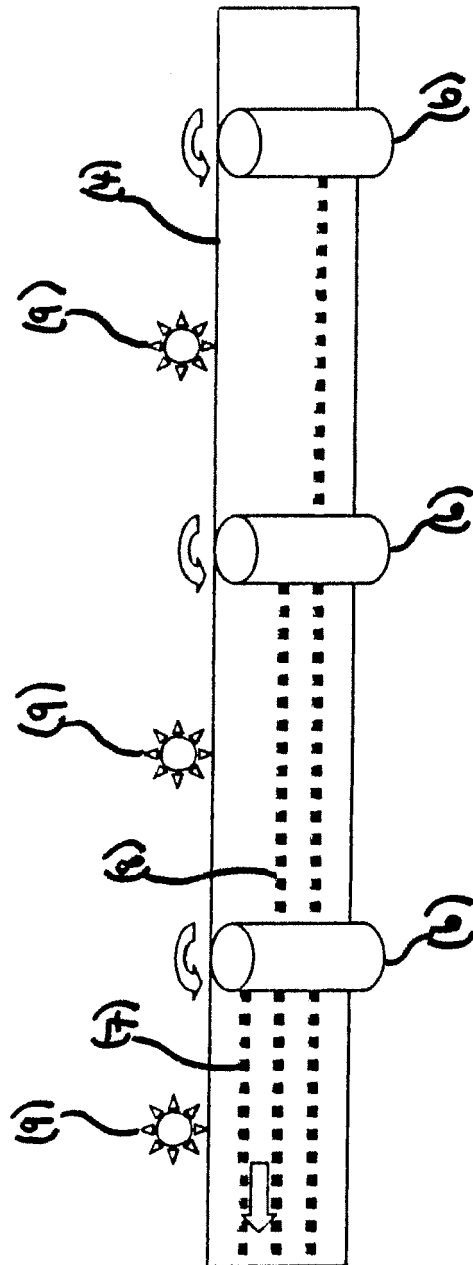


FIGURE 2

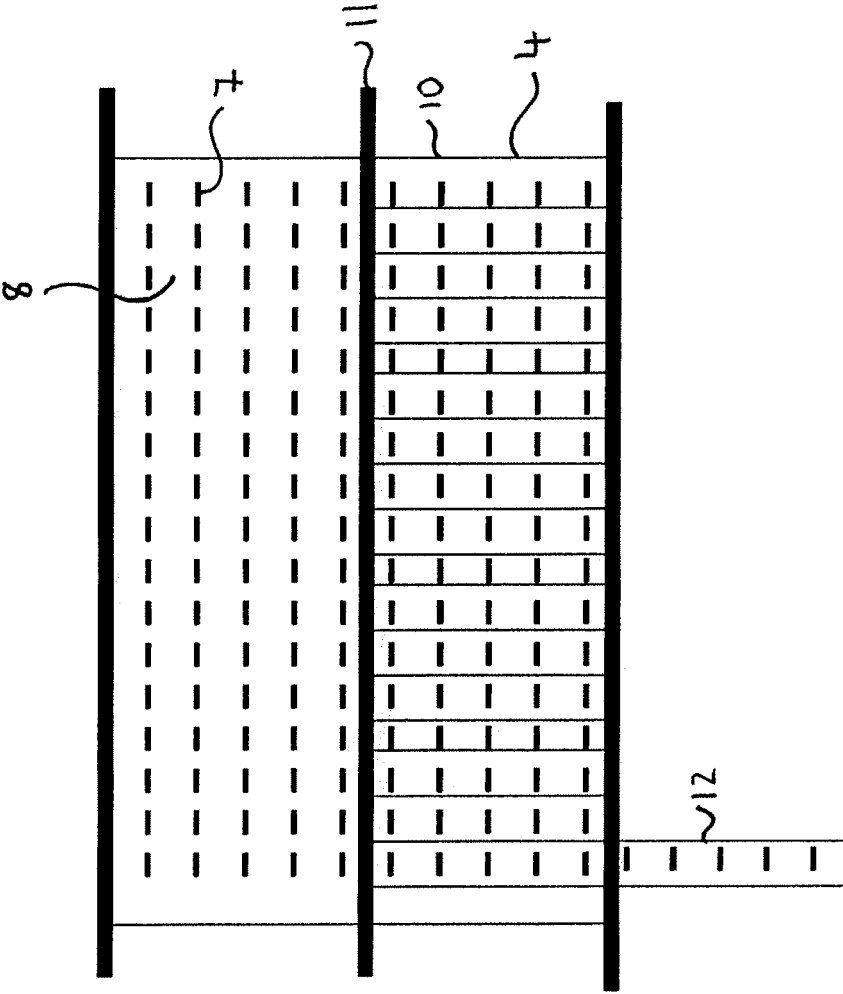


FIGURE 3

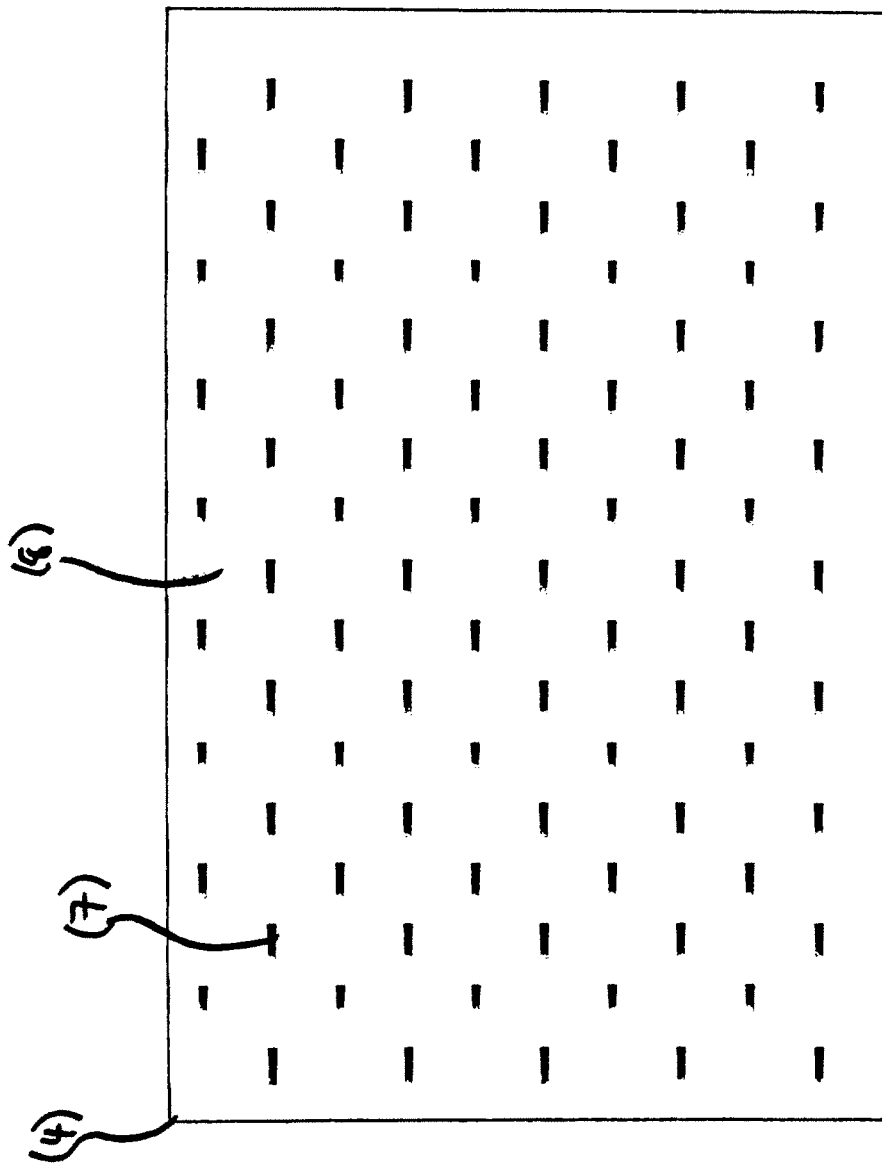


FIGURE 4

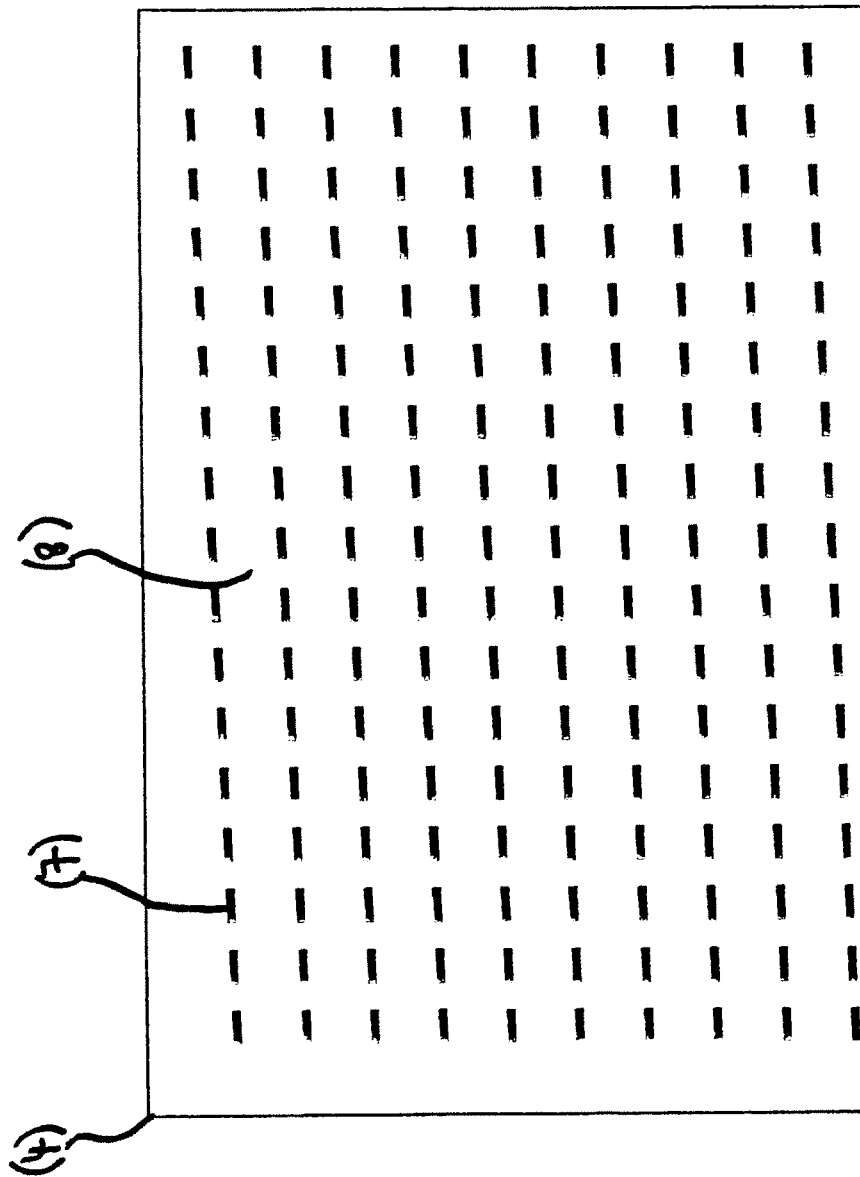


FIGURE 5

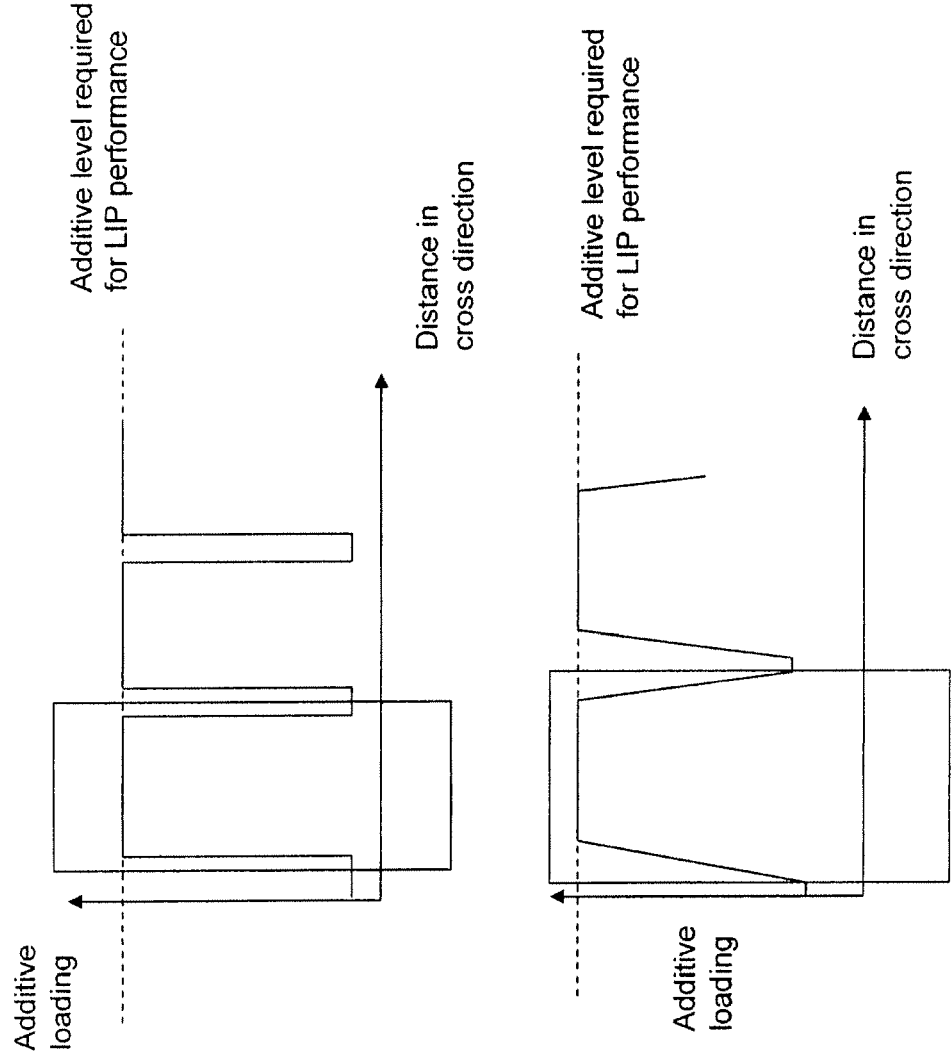


FIGURE 6

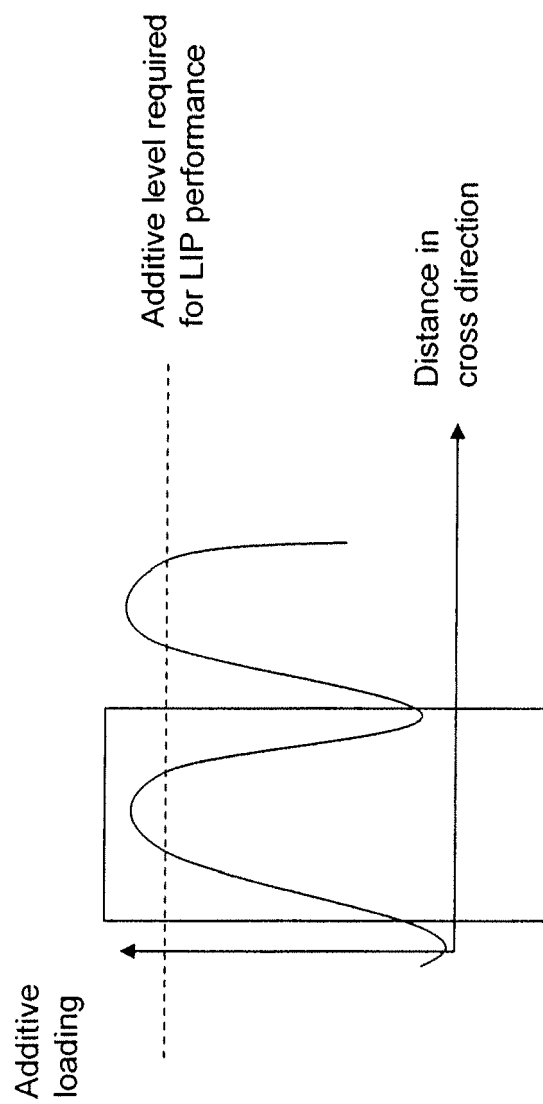


FIGURE 7

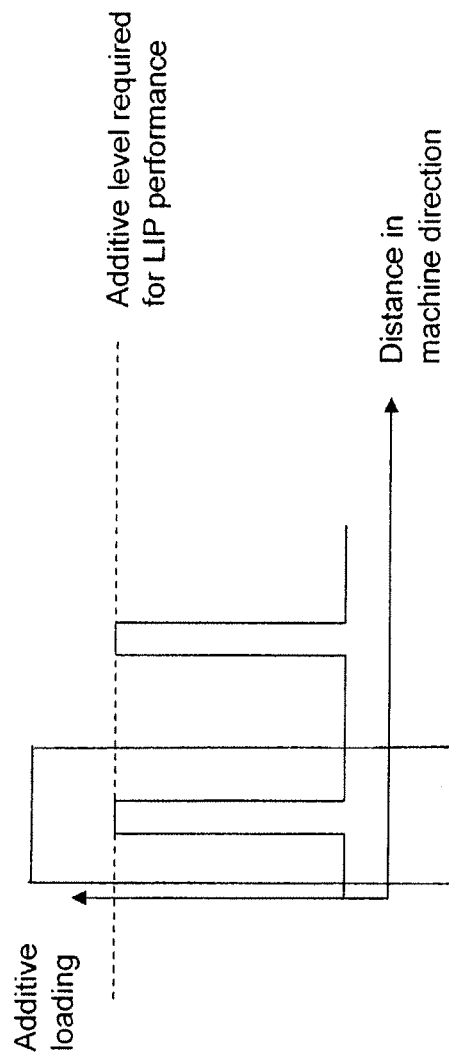


FIGURE 8

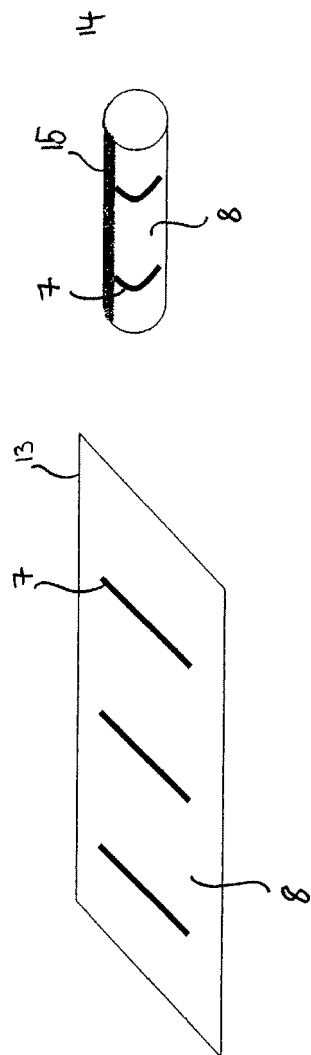


FIGURE 9



EUROPEAN SEARCH REPORT

Application Number
EP 09 17 8108

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2009/004482 A2 (PHILIP MORRIS PROD [CH]) 8 January 2009 (2009-01-08) * page 2, lines 12-30 * * page 4, line 6 - page 5, line 3 * * page 6, line 17 - page 7, line 27 * * claims 1,19 * * figures *	1-15	INV. A24D1/02
X	WO 2008/149241 A2 (PHILIP MORRIS PROD [CH]) 11 December 2008 (2008-12-11) * page 3, line 13 - page 5, line 8 * * claims 1,2,10,12,13,16,18 * * figures *	1-15	
X	US 5 450 863 A (COLLINS ALFRED L [US] ET AL) 19 September 1995 (1995-09-19) * column 2, line 42 - column 3, line 20 * * column 7, line 50 - column 8, line 16 * * figures 3,4,6 *	1,15	
X	EP 0 486 213 A1 (PHILIP MORRIS [US] PHILIP MORRIS PROD [US]) 20 May 1992 (1992-05-20) * column 1, lines 3-38 * * column 2, line 43 - column 3, line 11 * * column 3, lines 41-55 * * column 4, lines 38-48 *	1,15	TECHNICAL FIELDS SEARCHED (IPC) A24D
A	WO 2009/105343 A2 (SCHWEITZER MAUDUIT INT INC [US]; HAMPL VLADIMIR JR [US]; ROSSI-ESPAGNE) 27 August 2009 (2009-08-27) * page 4, lines 17-23 * * page 10, line 32 - page 11, line 9 *	5,11	
X	WO 2008/146159 A2 (PHILIP MORRIS PROD [CH]) 4 December 2008 (2008-12-04) * abstract; claims 8,12,13,16-24,34,36,39,40,42-48,59; figures *	1,15	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 10 May 2010	Examiner Kock, Søren
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 09 17 8108

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10-05-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2009004482 A2	08-01-2009	AU 2008272618 A1	08-01-2009
		CA 2688157 A1	08-01-2009
		CN 101677628 A	24-03-2010
		EP 2150140 A2	10-02-2010
		KR 20100020958 A	23-02-2010
WO 2008149241 A2	11-12-2008	AR 066713 A1	09-09-2009
		AU 2008259426 A1	11-12-2008
		CA 2684848 A1	11-12-2008
		EP 2150139 A2	10-02-2010
		KR 20100021629 A	25-02-2010
US 5450863 A	19-09-1995	NONE	
EP 0486213 A1	20-05-1992	AT 153507 T	15-06-1997
		AU 649493 B2	26-05-1994
		CA 2055717 A1	17-05-1992
		DE 69126277 D1	03-07-1997
		DE 69126277 T2	04-12-1997
		DK 0486213 T3	24-11-1997
		ES 2101723 T3	16-07-1997
		FI 915419 A	17-05-1992
		GR 3024484 T3	28-11-1997
		JP 3170330 B2	28-05-2001
		JP 4289298 A	14-10-1992
		NO 914487 A	18-05-1992
		US 5474095 A	12-12-1995
WO 2009105343 A2	27-08-2009	US 2009223529 A1	10-09-2009
WO 2008146159 A2	04-12-2008	AU 2008256335 A1	04-12-2008
		CA 2690199 A1	04-12-2008
		CN 101677632 A	24-03-2010
		EP 2155004 A2	24-02-2010