

Señor Director

DIRECCIÓN DE NUEVAS CREACIONES

Superintendencia de Industria y Comercio

E. S. D.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 13-115403- -00008-0000

Fecha: 2015-04-16 16:27:16
Tra. 11 PATENTE IYII
Act. 523 RESPUESTA

Dep. 2020 DIR NUEVASCR
Eve: 378 FASENACIONALI
Folios: 22

Trámite : 011

Evento : 378

Actuación : 523

Referencia : Expediente No. 13.115.403

Asunto : Solicitud de Patente para: **"COMPOSICIONES FLUIDAS APTAS PARA FORMAR UN REVESTIMIENTO QUE PRESENTA UNAS PROPIEDADES ANTIVÍRICAS"**

Solicitante : ARJOWIGGINS SECURITY

Fecha de solicitud : 8 de Mayo de 2008

1. Yo, Luz Clemencia DE PÁEZ, en mi condición de apoderada de la sociedad solicitante de la patente de la referencia, me refiero al oficio No. 15185 notificado por fijación en lista el 9 de Diciembre de 2014.

2. Mediante memorial del 4 de Marzo de 2015 se solicitó oportunamente plazo para responder la acción oficial arriba mencionada.

3. Mediante oficio No. 15185 se puso en conocimiento del solicitante el informe que contiene las observaciones hechas por su Despacho sobre la presente solicitud de patente. Las observaciones realizadas en el oficio se refieren a la presencia de

"EXCELENCIA LEGAL EN UN MUNDO SIN FRONTERAS"

reivindicaciones referentes a un uso o segundo uso, a la presencia de excepciones de patentabilidad, y al nivel inventivo de las reivindicaciones 1 a 12 en vista de los documentos D1: US5,968,538 y D2: Halldor Thormar et al. 1jan. 1987 (1987-01-01), pages 27-31, American Society for Microbiology.

4. Respuesta a las objeciones

De este modo y con el objeto de atender las objeciones arriba mencionadas, se desea presentar las siguientes modificaciones, aclaraciones y argumentos:

4.1. Modificación de una solicitud en trámite

De acuerdo con el artículo 34 de la Decisión 486 de la Comisión de la Comunidad Andina, donde se establece que la modificación de una solicitud es posible en cualquier momento del trámite mientras no implique una ampliación de la solicitud inicial, me permito presentar un nuevo pliego reivindicatorio conformado por 15 reivindicaciones.

El nuevo pliego reivindicatorio corresponde esencialmente al anterior, pero se ha restringido el alcance de la reivindicación 13 especificando un grupo conciso de posibilidades para el soporte cuya superficie va a ser tratada. Esta modificación se encuentra soportada en los renglones 12 a 17 de la primera página de la descripción originalmente presentada.

4.2. Con respecto a la excepción a la patentabilidad

Tal como se mencionó anteriormente, la reivindicación 13 ha sido modificada para especificar que el soporte flexible o sólido es seleccionado del grupo que consiste de billetes, o tarjetas tales como tarjetas con chip, artículos tales como, por ejemplo, juguetes, teclados y ratones de ordenadores, pantallas táctiles y teclados de teléfonos, pantallas y auriculares, instrumentos de cuidado médico o de salud, uñas, instrumentos de música, uniformes, herramientas y tejidos para mobiliario.

Puede entonces notarse que la nueva reivindicación 13, así como sus dependientes, excluye la posibilidad de contactar la composición que confiere propiedades viricidas con una superficie animal o humana.

De esta forma, las reivindicaciones 13 y 14 del nuevo pliego reivindicatorio no se extienden a, ni pueden ser interpretadas como, un método de tratamiento, por lo que no están dirigidas a la excepción de patentabilidad definida en el literal (d) del Artículo 20 de la Decisión 486 de la Comunidad Andina de Naciones.

Consecuentemente, se entiende por superada la objeción a las reivindicaciones 13 y 14 abarcar una excepción a la patentabilidad.

4.3. Con respecto a las reivindicaciones dirigidas a un uso

En primer lugar, es preciso mencionar que la reivindicación 13 está dirigida a un procedimiento definido por sus una secuencia lógica de pasos, que transforma la materia y tiene como resultado un producto específico y tangible. Este procedimiento no puede ser entendido como un uso, ya que comprende más de un paso, en donde al menos uno de los pasos no corresponde al simple uso de la formulación de ácido láurico. Específicamente, el paso c) de dicha reivindicación requiere un tratamiento térmico para sintetizar la monolaurina. Este paso realiza una transformación de la materia, por lo que no puede ser encasillado como un uso.

Por su parte, la reivindicación 15 está dirigida a un producto definido por su proceso de fabricación, que es novedoso e inventivo y no puede ser definido adecuadamente por sus características estructurales. Al respecto, la "GUÍA PARA EXAMEN DE SOLICITUDES DE PATENTE DE INVENCION Y MODELO DE UTILIDAD" de su Despacho establece que "Las reivindicaciones de productos definidas en términos de un proceso de fabricación son admisibles, solamente si los productos como tales cumplen los requisitos de patentabilidad, es decir, cuando son nuevos e inventivos, y cuando no se pueden definir por sus características estructurales". Por lo tanto, el producto de la reivindicación 15 define adecuadamente un producto físico y tangible.

Al respecto de la materia que es susceptible de patentabilidad, la Decisión 486 de la Comunidad Andina de Naciones establece en sus artículos 14 y 21 lo siguiente:

***"Artículo 14.-** Los Países Miembros otorgarán patentes para las invenciones, sean de producto o de procedimiento, en todos los campos de la tecnología, siempre que sean nuevas, tengan nivel inventivo y sean susceptibles de aplicación industrial".*

***"Artículo 21.-** Los productos o procedimientos ya patentados, comprendidos en el estado de la técnica, de conformidad con el artículo 16 de la presente Decisión, no serán objeto de nueva patente, por el simple hecho de atribuirse un uso distinto al originalmente comprendido por la patente inicial".*

Resulta evidente entonces que para que una reivindicación fuera excluida de patentabilidad por los artículos 14 y 21 de la Decisión 486 se tendría que cumplir alguna de las siguientes condiciones:

- a) No poder ser definida como un producto o procedimiento; o
- b) Corresponder a un segundo uso de un producto o procedimiento ya patentado.

Sin embargo, la reivindicación 13 está definida como una secuencia lógica de pasos, en la que se definen las condiciones específicas de cada paso. La realización de los pasos definidos en dicha reivindicación, en la secuencia propuesta, supone una transformación de la materia y resulta en un producto tangible específico. Por lo tanto, la reivindicación 13 **sí puede ser definida como un procedimiento.**

Además, el método de la reivindicación 13 no corresponde a un segundo uso de un producto o procedimiento ya patentado. Esto resulta evidente debido a que no existe objeción alguna al método de la reivindicación 13 por falta de novedad. Específicamente se debe mencionar que en el arte previo no existe patentado método alguno que comprenda los pasos de disponer la superficie de un soporte con un catalizador, poner en

contacto dicha superficie que contiene ácido láurico y glicerol, y aplicar un tratamiento térmico sobre dicha superficie. Por lo tanto, la reivindicación en cuestión **no puede ser considerada como un segundo uso de un procedimiento ya patentado.**

Por su parte, y como se mencionó anteriormente, la reivindicación 15 define un producto físico y tangible a través de su proceso de fabricación, lo que es aceptado bajo ciertos supuestos en la práctica de patentes colombiana, supuestos que se cumplen en este caso. Por lo tanto, la reivindicación 15 **sí puede ser definida como un producto.**

Además, el producto de la reivindicación 15 no corresponde a un segundo uso de un producto o procedimiento ya patentado. Esto resulta evidente debido a que no existe objeción alguna al producto de la reivindicación 15 por falta de novedad. Específicamente se debe mencionar que en el arte previo no existe patentado producto alguno que sea obtenido mediante un procedimiento que comprenda un paso de revestimiento con una composición fluida que contiene una cantidad eficaz de al menos un viricida de origen natural seleccionado entre el ácido láurico, monolaurina, lactoferrina y aceites esenciales de laurel y/o una combinación de glicerol y ácido láurico, poseyendo dicha composición una viscosidad comprendida entre 30 mPa.s y 40 Pa.s, a temperatura y presión ambiente, y que contiene entre 0,1% y 3% en peso seco de dicho viricida con relación al peso total de la composición. Por lo tanto, la reivindicación en cuestión **no puede ser considerada como un segundo uso de un producto ya patentado.** Además, dicha reivindicación no pretende proteger el ácido láurico ni sus usos.

En consecuencia de lo anterior, tanto la reivindicación 13 como la reivindicación 15 cumplen con ambas condiciones a) y b) arriba definidas. Por lo tanto, las dos reivindicaciones mencionadas están dirigidas a materia considerada patentable en la Decisión 486.

Por otro lado, cabe resaltar que la interpretación prejudicial plasmada en el proceso PROCESO 54-IP-2012 del TRIBUNAL DE JUSTICIA DE LA COMUNIDAD ANDINA establece claramente que:

“En la aplicación de la figura del complemento indispensable, el Tribunal reitera que las legislaciones internas de los Estados Miembros no podrán establecer exigencias, requisitos adicionales o dictar reglamentaciones que de una u otra manera restrinjan aspectos esenciales regulados por el Derecho Comunitario, de forma que signifiquen, por ejemplo, una menor protección de los derechos consagrados por la norma comunitaria. Por tanto, la potestad de las autoridades nacionales de los Estados Miembros de regular, a través de normas internas, y en el ejercicio de su competencia, los asuntos sobre Propiedad Industrial no comprendidos en la Decisión 486 de la Comisión de la Comunidad Andina, no podrá ser ejercida de modo tal que signifique la introducción de restricciones adicionales al ejercicio de los derechos y facultades consagrados por la norma comunitaria”.

En virtud de lo anterior, resulta claro que su despacho carece de la potestad de realizar requerimientos que limiten los derechos consagrados en la Decisión 486; específicamente, resulta indebido realizar exigencia alguna adicional a las condiciones a) y b) arriba definidas, que corresponden a las exigencias plasmadas en los artículos 14 y 21 de la Decisión 486 de la Comunidad Andina, en el ejercicio de definir la materia que puede ser susceptible de patentabilidad o no.

En conclusión, y en visto de los derechos consagrados por la norma comunitaria vigente, las reivindicaciones 13 y 15 debieron haber sido consideradas susceptibles de patentabilidad, y se debió haber hecho sobre las mismas un estudio de fondo para determinar su patentabilidad en términos de su novedad y nivel inventivo.

4.4. Argumentos a favor del nivel inventivo de la presente solicitud

En primer lugar, se debe resaltar que la composición de la presente invención difiere de las divulgaciones de D1 al menos en lo siguiente:

- i) El virucida de origen natural es seleccionado entre el ácido láurico, monolaurina, lactoferrina y aceites esenciales de laurel y/o una combinación de glicerol y ácido láurico; y

- ii) la composición contiene entre 0,1% y 3% en peso seco de dicho virucida con relación al peso total de la misma.

Adicionalmente, el problema solucionado por D1 corresponde a proveer un recubrimiento anti-patogénico a un sustrato de tipo médico que comprende una combinación específica de agentes, es decir, PVP-1 y nonoxinol 9 (N-9), de una forma comercialmente viable.

Incluso si una persona versada en la materia se hubiera visto motivado a usar agentes virucidas diferentes en el recubrimiento de D1, tanto las enseñanzas de D1 como las de D4 lo habrían orientado a utilizar agentes virucidas que ya se supiera que podrían proveer la propiedad virucida al soporte en cuestión.

Es bien sabido en el estado de la técnica que no todos los agentes virucidas pueden proveer su propiedad virucida a cualquier soporte que lo comprenda. Esto se ilustra, por ejemplo, en la solicitud US20050175712 (adjunta). Esta solicitud pretende proveer propiedades antimicóticas y antibacterianas a medios de información. En particular, los ejemplos de dicha solicitud muestran que muchos agentes activos que tienen ciertas propiedades no pueden proveer dichas propiedades al medio que las comprende (ver párrafos [0195] a [0196]).

Así, como es conocido en la técnica, y como lo demuestra la solicitud US20050175712, no existe certeza con respecto al resultado de un tratamiento de un soporte con un agente activo dado.

Consecuentemente, si una persona versada en la materia quisiera substituir los agentes virucidas de D1, acudiría a agentes que se supiera previamente que podrían sus propiedades virucidas al soporte que las comprende, este no es el caso de los agentes virucidas especificados en la reivindicación 1.

Si una persona versada en la materia quisiera substituir los agentes virucidas de D1 por otros compuestos cuya actividad sobre el soporte no se conociera tendría que recurrir a una cantidad excesiva de experimentos para determinar si el agente virucida

conferirá o no su actividad virucida al soporte, lo que corresponde a una actividad inventiva adicional y no a una simple aplicación de los conocimientos del documento D4.

Así, un técnico versado en la materia solo habría podido llegar a los agentes virucidas y proporciones reivindicados de forma obvia si conociera el contenido de la presente solicitud. Esto, sin embargo, corresponde a un análisis en retrospectiva, o *ex post facto*, que se encuentra claramente prohibido en el numeral 2.13.6.3 de la "GUÍA PARA EXAMEN DE SOLICITUDES DE PATENTE DE INVENCION Y MODELO DE UTILIDAD" de su Despacho.

Como consecuencia de lo anterior, la reivindicación independiente 1 es inventiva sobre el estado del arte citado. Consecuentemente, las reivindicaciones 2 a 12 son también inventivas en virtud de su dependencia de la reivindicación 1.

De acuerdo a todos los argumentos presentados, la presente solicitud cumple a cabalidad con los requerimientos exigidos en la Decisión 486 y las objeciones formuladas por el Examinador se ven superadas.

5. Puesto que se ha dado respuesta a todas las objeciones formuladas por el Examinador, se solicita atentamente proceder al otorgamiento de la solicitud de patente. En este sentido, respetuosamente recordamos al Examinador que la patente no podrá ser negada con base en objeciones diferentes a las expuestas en la acción oficial No. 519, toda vez que al no haber sido trasladadas a mi representada, dicha decisión violaría tanto el tenor literal del artículo 45 de la Decisión 486 como el derecho constitucional al debido proceso. En este evento, y con base en el inciso 2 del artículo 45, respetuosamente solicitamos al Examinador expedir una nueva acción oficial que permita a mi representada contra argumentar las mismas o modificar la solicitud con el fin de cumplir los requisitos de patentabilidad.

6. Anexos

- Nuevo pliego reivindicatorio conformado por 15 reivindicaciones
- Solicitud de patente US20050175712

Señor Director,


LUZ CLEMENCIA DE PÁEZ
C.C. 35.456.344 de Usaquén
T.P.A. No. 23.555

 COLO-18180-0841-0002-9
SML\SML\ID-279523\WPC18180
No. M-2015-279523\SML

REIVINDICACIONES

1. Composición fluida apta para formar un revestimiento, caracterizada porque contiene una cantidad eficaz de al menos un viricida de origen natural seleccionado entre el ácido láurico, monolaurina, lactoferrina y aceites esenciales de laurel y/o una combinación de glicerol y ácido láurico, poseyendo dicha composición una viscosidad comprendida entre 30 mPa.s y 40 Pa.s, a temperatura y presión ambiente, y que contiene entre 0,1% y 3% en peso seco de dicho viricida con relación al peso total de la composición.
2. Composición según la reivindicación 1, caracterizada porque contiene además al menos un biocida bacteriostático y/o bactericida o un biocida fungistático y/o fúngico seleccionado entre el grupo que consiste de cloro de miristil-dimetil-bencilamonio, sacarina de alquil-dimetil-bencilamonio, piritionas, diyodometil-p-tolilsulfona y 3-yodopropargil-N-butilcarbamato.
3. Composición según cualquiera de las reivindicaciones anteriores, caracterizada porque contiene entre 0,1% y 2% en peso seco, por ejemplo entre 0,5% y 1,5% en peso seco, de dicho viricida con relación a su peso total.
4. Composición según cualquiera de las reivindicaciones anteriores, caracterizada porque contiene además un agente humectante seleccionado del grupo que consiste de:
 - poliol seleccionado entre glicerol, propilenglicol, polietilenglicol, butilenglicol, triacetato de glicerilo y sorbitol,
 - ácido pidólico (PCA) y sus derivados seleccionados entre arginina PCA, cobre PCA, etilhexilo PCA, laurilo PCA, magnesio PCA, sodio PCA y zinc PCA,
 - gluconato de calcio,
 - fructosa, glucosa, isomalta, lactosa, maltitol, manitol, polidextrosa, sacarosa y el xilitol,
 - ácido glicirhízico,
 - histidina,
 - ácido hialurónico y hialuronato de sodio,
 - hidrolisados de seda, de queratina o de soja,
 - fitantriol,
 - seda, y
 - urea.
5. Composición según la reivindicación anterior, caracterizada porque el agente humectante es glicerol.

6. Composición según cualquiera de las reivindicaciones anteriores, caracterizada porque la relación ponderal masa de agente humectante sobre masa de viricida es al menos igual a 1.
7. Composición según cualquiera de las reivindicaciones anteriores, que comprende además al menos un agente ligante seleccionado entre resinas, ceras y gomas.
8. Composición según cualquiera de las reivindicaciones anteriores, caracterizada porque es de tipo tinta o barniz.
9. Composición según cualquiera de las reivindicaciones anteriores, caracterizada porque se trata de una tinta que contiene al menos un pigmento y al menos un agente ligante seleccionado entre una cera polietilénica, una resina acrílica, y sus mezclas, dicho pigmento seleccionado entre el grupo que consiste de:
 - pigmentos minerales seleccionados entre titanio, óxidos de zirconio o cerio o zinc, óxidos de hierro o de cromo, azul férrico, violeta de manganeso, azul ultramar e hidrato de cromo;
 - pigmentos orgánicos seleccionados entre negro de carbón, pigmentos de tipo D&C y lacas de carmina de cochinilla, bario, estroncio, calcio o aluminio; y
 - pigmentos perlescentes seleccionados entre mica de titanio recubierta con un óxido de hierro, mica de titanio recubierta de oxiclورو de bismuto, mica de titanio recubierta con óxido de cromo, mica de titanio recubierta de colorante orgánico así como pigmentos nacarados a base de oxiclورو de bismuto, y mica natural recubierta de óxido de titanio, de óxido de hierro, de pigmento natural o de oxiclورو de bismuto.
10. Composición según cualquiera de las reivindicaciones anteriores, caracterizada porque contiene una cantidad de pigmentos comprendida entre 0% y 60% en peso, en particular entre 10% y 50% en peso, y particularmente comprendida entre 15% y 35% en peso, con relación al peso total de dicha composición, dicho pigmento seleccionado entre el grupo que consiste de:
 - pigmentos minerales seleccionados entre titanio, óxidos de zirconio o cerio o zinc, óxidos de hierro o de cromo, azul férrico, violeta de manganeso, azul ultramar e hidrato de cromo;
 - pigmentos orgánicos seleccionados entre negro de carbón, pigmentos de tipo D&C y lacas de carmina de cochinilla, bario, estroncio, calcio o aluminio; y
 - pigmentos perlescentes seleccionados entre mica de titanio recubierta con un óxido de hierro, mica de titanio recubierta de oxiclورو de bismuto, mica de titanio recubierta con óxido de cromo, mica de titanio recubierta de colorante orgánico así como pigmentos nacarados a base de oxiclورو de bismuto, y mica natural

recubierta de óxido de titanio, de óxido de hierro, de pigmento natural o de oxiclورو de bismuto.

11. Composición según cualquiera de las reivindicaciones 1 a 8, caracterizada porque se trata de un barniz que contiene al menos un agente ligante seleccionado entre una cera polietilénica, una resina acrílica, y sus mezclas.
12. Composición fluida según cualquiera de las reivindicaciones 1 a 8, caracterizada porque se trata de un barniz de sobreimpresión que contiene al menos un agente ligante seleccionado entre las resinas epoxi-cicloalifáticas.
13. Procedimiento útil para conferir unas propiedades viricidas a todo o parte de la superficie de un soporte flexible o sólido, que comprende al menos las etapas que consisten en:
 - a) disponer de un soporte flexible o sólido cuya superficie a tratar comprende al menos un catalizador y/o un agente reactivo apto para estimular la interacción entre el ácido láurico y el glicerol;
 - b) poner en contacto dicha superficie con una composición según la reivindicación 1 que contiene al menos ácido láurico y glicerol; y
 - c) aplicar en la superficie tratada en la etapa b) un tratamiento térmico propicio a la síntesis de la monolaurina;pudiendo ser realizadas las etapas b) y c) consecutiva o simultáneamente, siendo dicho soporte flexible o sólido seleccionado del grupo que consiste de billetes, o tarjetas tales como tarjetas con chip, artículos tales como, por ejemplo, juguetes, teclados y ratones de ordenadores, pantallas táctiles y teclados de teléfonos, pantallas y auriculares, instrumentos de cuidado médico o de salud, uñas, instrumentos de música, uniformes, herramientas y tejidos para mobiliario.
14. Procedimiento según la reivindicación 13, en el que el catalizador es un catalizador de tipo zeolita o una lipasa.
15. Objeto caracterizado por ser susceptible de obtenerse mediante un procedimiento que comprende al menos una etapa de revestimiento de la superficie con una composición tal como la que se define en las reivindicaciones 1 a 12.



US 20050175712A1

13

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2005/0175712 A1**
Jayet-Laraffe et al. (43) **Pub. Date: Aug. 11, 2005**

(54) **DATA MEDIUM HAVING BIOCIDAL PROPERTIES AND METHOD FOR MAKING SAME**

(30) **Foreign Application Priority Data**

Apr. 8, 2002 (FR) 02/04363

Publication Classification

(76) **Inventors:** Christiane Jayet-Laraffe, La
Batie-Divisin (FR); Henri Rosset, Le
Pin (FR)

(51) **Int. Cl.⁷** G11B 7/24; A61K 33/38;
A61K 33/32; A61K 31/425
(52) **U.S. Cl.** 424/618; 424/641; 430/270.11;
514/55; 514/372

Correspondence Address:
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747 (US)

(57) **ABSTRACT**

The invention relates to an information carrier intended to be handled relatively frequently, characterized in that it contains at least one biocidal agent. This information carrier is in particular intended for the production of a banknote, of a passport, of a playing card, of a packaging, of a book or of a magazine. The invention also relates to the process for producing said information carrier, characterized in that at least one biocidal agent is incorporated into a basic carrier made of cellulosic and/or plastic materials.

(21) **Appl. No.:** 10/510,347

(22) **PCT Filed:** Apr. 8, 2003

(86) **PCT No.:** PCT/FR03/01097

DATA MEDIUM HAVING BIOCIDAL PROPERTIES AND METHOD FOR MAKING SAME

[0001] The invention relates to an information carrier intended to be handled relatively frequently, in particular a banknote.

[0002] More specifically, the invention relates to an information carrier exhibiting biocidal properties and to the process for producing it.

[0003] In modern societies, an increasingly large quantity of carriers intended to transmit information is handled daily and frequently by a large number of individuals, for whom no health control is required.

[0004] Now, these individuals, due to their environment, their professional activity, their entourage and the healthiness of their lifestyle, may be carrying germs, microbes and contaminating agents in general, which generate more or less serious epidemic and pandemic diseases.

[0005] Thus, the information carrier handled by these individuals is, in turn, liable to contain such pathogenic microorganisms.

[0006] It then becomes an important vehicle for disseminating bacteria, yeast and fungi and can potentially cause infections in those who handle it.

[0007] In addition, recently, since the possibility of a terrorist act by bacteriological contamination of such information carriers is no longer to be neglected, the risk associated with handling such information carriers is becoming particularly sensitive.

[0008] As currency in commercial transactions, the banknote constitutes one of the information carriers most commonly handled throughout the world and, as a result, represents a potential threat to our health.

[0009] In many countries, the notes are handled billions of times during their circulation period.

[0010] They then become loaded up with microorganisms originating both from the ambient environment and from the human organism.

[0011] A study carried out by the Gazaga da Gama Filho Biochemical Research Institute in Brazil on the microbial contamination of Brazilian banknotes, and presented on Sep. 28, 2001, revealed in particular the presence of two specific contaminating agents, *Staphylococcus* sp and *Escherichia coli*.

[0012] The presence of these two microorganisms may, for the person who handles the banknote, result in various infections, which range from superficial diseases such as skin lesions, to styes, otitis, sinusitis, pharyngitis and other more serious ailments according to the sites of penetration, the amounts, the virulence of the sample, and the individual resistance.

[0013] In this context, the emerging tendency of banknotes having a more prolonged lifespan can only worsen, for the future, the risk of contamination associated with the handling of these notes.

[0014] Although it is not really new, the problem of the contamination of information carriers in general, and of

banknotes in particular, has nevertheless up until now, to the applicant's knowledge, not been the subject of sufficient exhaustive investigations.

[0015] The study cited above mentions first of all the possibility of using a plastic material instead of the conventional cellulosic fibrous material for producing said banknotes.

[0016] The cellulosic fibrous material which has a tendency to absorb moisture is thought to promote the development of microorganisms within it.

[0017] Now, the study shows that this change reduces but does not eliminate the risk of contamination.

[0018] Other technical solutions have recently been disclosed in the prior art and in fact consist in treating the banknote paper with an antimicrobial agent.

[0019] Patent application WO 95/42658 envisions in particular the addition of a biguanide-based substantive antimicrobial agent.

[0020] Now, the applicant has noted that these prior solutions either do not completely satisfy the problem posed, since the antimicrobial agent does not have a complete, i.e. both antifungal and antibacteriological, biocidal action, or satisfies the problem posed at the cost of a substantial addition of antimicrobial agent.

[0021] These prior solutions therefore prove to be ineffective and too expensive.

[0022] In addition, antimicrobial agents are generally characterized by a degree of toxicity; adding them at a high dose can therefore prove to be unsuitable, or even dangerous.

[0023] The invention is aimed at providing an information carrier exhibiting both antifungal and antibacteriological properties, and not exhibiting the disadvantages of the prior art.

[0024] The applicant, after having tested many biocidal compositions, has succeeded, surprisingly, in solving the problems posed by treating the information carrier using a mixture of two biocidal agents, one having a fungistatic and/or fungicidal action, the other having a bacteriostatic and/or bactericidal action.

[0025] It has also proved to be the case that, among the antiseptic agents tested, some could exhibit the two actions at the same time.

[0026] Thus, the invention provides an information carrier intended to be handled relatively frequently, characterized in that it contains at least one biocidal agent.

[0027] Preferably, the information carrier contains at least one bacteriostatic and/or bactericidal agent and/or at least one fungistatic and/or fungicidal agent.

[0028] Preferably, at least one bacteriostatic and/or bactericidal agent is chosen from the compounds based on chitosan or chitin derivatives, on quaternary ammonium, on zinc zeolite, on silver ions and on triclosan.

[0029] Preferably, at least one bacteriostatic and/or bactericidal agent is based on didecyltrimethylammonium chloride.

[0030] Preferably, at least one fungistatic and/or fungicidal agent is chosen from the compounds based on isothiazolin or isothiazolone derivatives, on chitosan or chitin derivatives, on quaternary ammonium, on zinc zeolite, on silver ions and on triclosan.

[0031] Preferably, at least one fungistatic and/or fungicidal agent is based on p-[(diiodomethyl)sulfonyl]toluol, on iodopropynyl butyl carbamate or on methyl-1H-benzimidazol-2-yl carbamate in the form of an aqueous dispersion.

[0032] Preferably, the quantity by dry weight of biocidal agent in the carrier is less than 1%, and preferably less than 0.2%.

[0033] Preferably, after one hour of dynamic contact of the carrier with a strain of *Escherichia coli* or of *Staphylococcus aureus*, the percentage decrease in the activity of the corresponding strains is greater than 99.9%, under the conditions defined by the ASTM E 2149-01 method.

[0034] Also preferably, after 24 hours of dynamic contact of the carrier with a strain of *Escherichia coli* or of *Staphylococcus aureus*, the antibacterial activity defined by the XPG 39010 method is negative.

[0035] In one embodiment, the information carrier is formed based on cellulosic materials, in particular paper.

[0036] In another embodiment, the information carrier is based on plastic materials.

[0037] Preferably, the information carrier is intended for the production of a banknote, of a passport, of a playing card, of a chipcard, of a packaging, of a book or of a magazine.

[0038] Another subject of the invention relates to a process for producing the information carrier mentioned above, characterized in that at least one biocidal agent is incorporated into a basic carrier made of cellulosic and/or plastic materials.

[0039] The incorporation of said biocidal agent into the basic carrier may be carried out in various ways:

[0040] by immersing said basic carrier in a solution of said biocidal agent,

[0041] by spraying said basic carrier with a solution of said biocidal agent,

[0042] by printing said basic carrier using an ink containing said biocidal agent,

[0043] by surfacing said basic carrier with a solution containing said biocidal agent and an aqueous surfacing agent, the aqueous surfacing agent preferably incorporating glycerol as plasticizer,

[0044] by coating said basic carrier with a coating solution containing said biocidal agent,

[0045] by depositing onto said basic carrier an overprint varnish containing said biocidal agent,

[0046] by coating microcapsules or cyclodextrin containing said biocidal agent onto said basic carrier.

[0047] The following nonlimiting examples will make it possible to understand more fully the way in which the invention can be put into practice and its advantages.

COMPARATIVE EXAMPLE 1

[0048] A sheet of paper is formed on a paper machine, termed cylinder mould, with a wire cloth comprising a pattern for producing a watermark, it being possible for this paper to be suitable as paper for producing a banknote, in the following way:

[0049] a paste of cotton fibers is suspended in water, this suspension is refined at 60° Schoepper-Riegler,

[0050] a wet resistance agent, approximately 2.5% by dry weight of a poly(amide-amine-epichlorohydrin) resin, expressed relative to the cotton fibers, is added;

[0051] small iridescent boards are also introduced into this suspension;

[0052] during the formation of the sheet, a micro-printed security thread, termed "window thread", is introduced according to known prior techniques, so that the thread appears in certain windows at the surface of the paper. A method that can be used to introduce this thread is described, for example, in patent EP 59056;

[0053] after the sheet has been formed, it is surface-treated with a sizing agent in a size-press;

[0054] the sheet is dried at around 100° C.

EXAMPLE 2

According to the Invention

[0055] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0056] 98 parts by commercial weight of a PVA binder,

[0057] 2 parts by commercial weight of an isothiazolin-based biocidal agent sold under the reference "Microbiocide B43F" by the company Intace.

[0058] The concentration of biocidal agent relative to the total bath is set at 0.05%.

[0059] The pH of the impregnating composition is fixed at 6.6.

[0060] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.037%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.02%.

EXAMPLE 3

According to the Invention

[0061] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0062] 94 parts by commercial weight of a PVA binder,

[0063] 6 parts by commercial weight of an isothiazolin-based biocidal agent sold under the reference "Microbiocide B43F" by the company Intace.

[0064] The concentration of biocidal agent relative to the total bath is set at 0.2%.

[0065] The pH of the impregnating composition is fixed at 6.6.

[0066] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.14%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.07%.

EXAMPLE 4

According to the Invention

[0067] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0068] 75 parts by commercial weight of a PVA binder,

[0069] 25 parts by commercial weight of a chitosan-based biocidal agent sold under the reference "Chitogel" by the company France Chitine.

[0070] The concentration of biocidal agent relative to the total bath is set at 1.0%.

[0071] The pH of the impregnating composition is fixed at 6.8.

[0072] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.75%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.4%.

EXAMPLE 5

According to the Invention

[0073] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0074] 70 parts by commercial weight of a PVA binder,

[0075] 30 parts by commercial weight of a chitosan-based biocidal agent sold under the reference "Chitosan 241" by the company France Chitine.

[0076] The concentration of biocidal agent relative to the total bath is set at 1.25%.

[0077] The pH of the impregnating composition is fixed at 5.2.

[0078] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.925%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.5%.

EXAMPLE 6

According to the Invention

[0079] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0080] 94 parts by commercial weight of a PVA binder,

[0081] 6 parts by commercial weight of a didecyltrimethylammonium chloride-based biocidal agent sold under the reference "Microbiocide B74" by the company Intace.

[0082] The concentration of biocidal agent B74 relative to the total bath is set at 0.2%.

[0083] The pH of the impregnating composition is fixed at 6.4.

[0084] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.142%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.07%.

EXAMPLE 7

According to the Invention

[0085] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0086] 88 parts by commercial weight of a PVA binder,

[0087] 6 parts by commercial weight of a didecyltrimethylammonium chloride-based biocidal agent sold under the reference "Microbiocide B74" by the company Intace,

[0088] 6 parts by commercial weight of an isothiazolin-based biocidal agent sold under the reference "Microbiocide B43F" by the company Intace.

[0089] The concentrations of biocidal agent B74 and B43F relative to the total bath are set at 0.2%.

[0090] The pH of the impregnating composition is fixed at 6.07.

[0091] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.28%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.14%.

EXAMPLE 8

According to the Invention

[0092] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0093] 94 parts by commercial weight of a PVA binder,

[0094] 6 parts by commercial weight of a 3-(methoxysilyl)propyldimethyloctadecyl-ammonium chloride-based biocidal agent sold under the reference "AEM 5772/5" by the company Devan.

[0095] The concentration of biocidal agent relative to the total bath is set at 0.2%.

[0096] The pH of the impregnating composition is fixed at 6.08.

[0097] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.15%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.08%.

EXAMPLE 9

According to the Invention

[0098] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0099] 86 parts by commercial weight of a PVA binder,

[0100] 14 parts by commercial weight of a 3-(methoxysilyl)propyldimethyloctadecyl-ammonium chloride-based biocidal agent sold under the reference "AEM 5772/5" by the company Devan.

[0101] The concentration of biocidal agent relative to the total bath is set at 0.5%.

[0102] The pH of the impregnating composition is fixed at 6.08.

[0103] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.37%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.19%.

EXAMPLE 10

According to the Invention

[0104] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0105] 75 parts by commercial weight of a PVA binder,

[0106] 25 parts by commercial weight of a 3-(methoxysilyl)propyldimethyloctadecyl-ammonium chloride-based biocidal agent sold under the reference "AEM 5772/5" by the company Devan.

[0107] The concentration of biocidal agent relative to the total bath is set at 1.0%.

[0108] The pH of the impregnating composition is fixed at 6.08.

[0109] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.73%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.37%.

EXAMPLE 11

According to the Invention

[0110] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0111] 50 parts by commercial weight of a PVA binder,

[0112] 50 parts by commercial weight of a 3-(methoxysilyl)propyldimethyloctadecyl-ammonium chloride-based biocidal agent sold under the reference "AEM 5772/5" by the company Devan.

[0113] The concentration of biocidal agent relative to the total bath is set at 3.0%.

[0114] The pH of the impregnating composition is fixed at 6.08.

[0115] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 2.22%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 1.1%.

EXAMPLE 12

According to the Invention

[0116] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0117] 75 parts by commercial weight of a PVA binder,

[0118] 25 parts by commercial weight of a sodium phenylphenolate-based biocidal agent sold under the reference "Bactolyse 74880" by the company Ondeo.

[0119] The concentration of biocidal agent relative to the total bath is set at 1.0%.

[0120] The pH of the impregnating composition is fixed at 6.6.

[0121] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.72%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.36%.

EXAMPLE 13

According to the Invention

[0122] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0123] 80 parts by commercial weight of a PVA binder,

[0124] 20 parts by commercial weight of a isothiazolone derivative-based biocidal agent sold under the reference "Surfasept 74818" by the company Ondeo.

[0125] The concentration of biocidal agent relative to the total bath is set at 0.7%.

[0126] The pH of the impregnating composition is fixed at 6.6.

[0127] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.525%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.26%.

EXAMPLE 14

According to the Invention

[0128] A carrier according to Example 1 is used and is impregnated in an impregnation tank containing a composition prepared in aqueous medium, which comprises:

[0129] 97 parts by commercial weight of PVA binder,

[0130] 3 parts by commercial weight of a p-[(diiodomethyl)sulfonyl]toluol-based biocidal agent sold under the reference "Surfasept 74859" by the company Ondeo.

[0131] The concentration of biocidal agent relative to the total bath is set at 0.1%.

[0132] The pH of the impregnating composition is fixed at 6.8.

[0133] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.075%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.04%.

EXAMPLE 15

According to the Invention

[0134] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0135] 12.2 parts by commercial weight of a PVA binder,

[0136] 86.7 parts by commercial weight of a polyurethane binder,

[0137] 0.1 part by commercial weight of a didecyldimethylammonium chloride-based biocidal agent sold under the reference "Microbiocide B74" by the company Intace,

[0138] 1.0 part by commercial weight of an iodopropynyl butyl carbamate-based biocidal agent sold under the reference "Fungitrol 420" by the company ISP.

[0139] The concentrations of biocidal agent B74 and Fungitrol 420 relative to the total bath are set, respectively, at 0.05% and 0.5%.

[0140] Once impregnated, the paper comprises a content by commercial weight of biocidal product, respectively, of 0.04% and of 0.4%, which corresponds to a content by dry weight of biocidal product in the paper, respectively, of approximately 0.02% and of approximately 0.08%.

EXAMPLE 16

According to the Invention

[0141] A carrier according to Example 1 is used and is surface-coated, using a size press, with a composition prepared in aqueous medium, which comprises:

[0142] 12.3 parts by commercial weight of a PVA binder,

[0143] 87.0 parts by commercial weight of a polyurethane binder,

[0144] 0.1 part by commercial weight of a didecyldimethylammonium chloride-based biocidal agent sold under the reference "Microbiocide B74" by the company Intace,

[0145] 0.7 part by commercial weight of an iodopropynyl butyl carbamate-based biocidal agent sold under the reference "Fungitrol 420" by the company ISP.

[0146] The concentrations of biocidal agent B74 and Fungitrol 420 relative to the total coating mixture are set, respectively, at 0.05% and 0.5%.

[0147] Once coated, the paper comprises a content by commercial weight of biocidal product, respectively, of 0.04% and of 0.27%, which corresponds to a content by dry weight of biocidal product in the paper, respectively, of approximately 0.02% and of approximately 0.05%.

EXAMPLE 17

According to the Invention

[0148] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0149] 98.4 parts by commercial weight of a PVA binder,

[0150] 0.8 part by commercial weight of a didecyldimethylammonium chloride-based biocidal agent sold under the reference "Microbiocide B74" by the company Intace,

[0151] 0.8 part by commercial weight of a p-[(diiodomethyl)sulfonyl]toluol-based biocidal agent sold under the reference "Surfasept 74859" by the company Onco.

[0152] The concentrations of biocidal agent B74 and Surfasept 74859 relative to the total bath are set, respectively, at 0.05% and 0.05%.

[0153] Once impregnated, the paper comprises a content by commercial weight of biocidal product, respectively, of 0.04% and of 0.04%, which corresponds to a content by dry weight of biocidal product in the paper, respectively, of approximately 0.02% and of approximately 0.02%.

EXAMPLE 18

According to the Invention

[0154] A carrier according to Example 1 is used and is surface-coated, using a size press, with a composition prepared in aqueous medium, which comprises:

[0155] 98.4 parts by commercial weight of a PVA binder,

[0156] 0.8 part by commercial weight of a didecyldimethylammonium chloride-based biocidal agent sold under the reference "Microbiocide B74" by the company Intace,

[0157] 0.8 part by commercial weight of a p-[(diiodomethyl)sulfonyl]toluol-based biocidal agent sold under the reference "Surfasept 74859" by the company Onco.

[0158] The concentrations of biocidal agent B74 and Surfasept relative to the total coating mixture are set, respectively, at 0.05% and 0.05%.

[0159] Once coated, the paper comprises a content by commercial weight of biocidal product, respectively, of 0.04% and of 0.04%, which corresponds to a content by dry weight of biocidal product in the paper, respectively, of approximately 0.02% and of approximately 0.015%.

EXAMPLE 19

According to the Invention

[0160] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0161] 95.9 parts by commercial weight of a PVA binder,

[0162] 0.8 part by commercial weight of a didecyldimethylammonium chloride-based biocidal agent sold under the reference "Microbiocide B74" by the company Intace,

[0163] 3.3 parts by commercial weight of a methyl-1H-benzimidazol-2-yl carbamate-based biocidal agent sold under the reference "Surfasept 74843 P" by the company Aquazur P&P.

[0164] The concentrations of biocidal agent B74 and Surfasept 74843 P relative to the total bath are set, respectively, at 0.05% and 0.2%.

[0165] Once impregnated, the paper comprises a content by commercial weight of biocidal product, respectively, of 0.04% and of 0.15%, which corresponds to a content by dry weight of biocidal product in the paper, respectively, of approximately 0.02% and of approximately 0.07%.

EXAMPLE 20

According to the Invention

[0166] A carrier according to Example 1 is used and is surface-coated, using a size press, with a composition prepared in aqueous medium, which comprises:

[0167] 96.1 parts by commercial weight of a PVA binder,

[0168] 0.8 part by commercial weight of a didecyldimethylammonium chloride-based biocidal agent sold under the reference "Microbiocide B74" by the company Intace,

[0169] 3.1 parts by commercial weight of a methyl-1H-benzimidazol-2-yl carbamate-based biocidal agent sold under the reference "Surfasept 74843 P" by the company Aquazur P&P.

[0170] The concentrations of biocidal agent B74 and Surfasept 74843 P relative to the total coating mixture are set, respectively, at 0.05% and 0.2%.

[0171] Once coated, the paper comprises a content by commercial weight of biocidal product, respectively, of 0.04% and of 0.15%, which corresponds to a content by dry weight of biocidal product in the paper, respectively, of approximately 0.02% and of approximately 0.06%.

EXAMPLE 21

According to the Invention

[0172] A carrier according to Example 1 is used and is impregnated in an impregnating tank containing a composition prepared in aqueous medium, which comprises:

[0173] 60.9 parts by commercial weight of a PVA binder,

[0174] 38.1 parts by commercial weight of a gelatin-type binder,

[0175] 1.0 part by commercial weight of a biocidal agent based on a mixture of 1,2-benzisothiazolin-3-one and of methyl-1-(butylcarbonyl)-2-benzimidazole carbamate sold under the reference "IBP-416" by the company IPEI..

[0176] The concentration of biocidal agent relative to the total bath is set at 1%.

[0177] Once impregnated, the paper comprises a content by commercial weight of biocidal product of 0.07%, which corresponds to a content by dry weight of biocidal product in the paper of approximately 0.04%.

[0178] Tests and Results:

[0179] The resistance of the carriers to the development of fungi and of bacteria was tested; this corresponds to both a fungistatic and bacteriostatic test.

[0180] The fungistatic test, which is the applicant's own test, uses the method presented in the appendix.

[0181] It is based both on ASTM standard G21-90 and on AFNOR standard NF X 41517.

[0182] The bacteriostatic test consists in evaluating the antibacterial resistance of the treated carriers to the growth of microbes under conditions of dynamic contact. The method used for Examples 1 to 14 is that described in ASTM standard E 2149-01.

[0183] It consists in bringing the treated carrier into contact in a bacterial suspension comprising the strain to be studied, with agitation for, respectively, one hour and 24 hours.

[0184] The antibacterial activity is defined by the determination, in the bacterial suspension, of the number of colony-forming units before and after the test.

[0185] A loss of microbial activity is deduced therefrom, and is expressed as a percentage. The method used for Examples 15 to 21 is that described in standard XPG 39010.

[0186] It consists in bringing the treated carrier into contact in a bacterial suspension comprising the strain to be studied, with agitation for, respectively, 0 hour and 24 hours.

[0187] The antibacterial activity is defined by the determination, in the bacterial suspension, of the number of colony-forming units before and after the test.

[0188] An antibacterial activity A is deduced therefrom, which activity is defined by the following formula:

$$A = \text{mean of } \log(E24i) \text{ values} - \text{mean of } \log(E0i) \text{ values,}$$

[0189] where E24i corresponds to the number of CFUs present on the test piece i at 24 h and E0i corresponds to the number of CFUs present on the test piece i just after it has been brought into contact with the antibacterial agent.

[0190] In Examples 1 to 14, the strain studied was *Escherichia coli*.

[0191] In Examples 15 to 21, the strain studied was *Staphylococcus aureus*.

[0192] The results with these two series of tests were combined in Table 1, for Examples 1 to 14, and in Table 2, for Examples 15 to 21.

[0193] Some examples, for which the antibacterial activity was rather weak, were not subjected to bacteriostatic tests.

[0194] It is noted that, for the series of Examples 1 to 14, Examples 6 and 7 are particularly suitable for combating the growth of *Escherichia coli* strains. Compared to Examples 8 to 11, using another quaternary ammonium-based biocidal agent, they act rapidly and effectively at very low concentrations.

[0195] As regards the fungistatic activity, only Examples 13 and 14 provide a complete absence of development of fungi.

[0196] They are, on the other hand, ineffective against bacterial development.

[0197] A conjugated addition of the biocidal agent of Example 6 and of Example 14 is therefore particularly recommended for obtaining complete biocidal protection for said information carrier.

[0198] As regards the series of Examples 15 to 21, it is noted that all the biocidal agents used have quite a thorough bactericidal action, given that all the CFUs present on the paper samples disappeared 24 hours after it had been brought into contact with said agents.

[0199] Their fungistatic potency is also considerable, with the exception of Example 21, for which the applicant observes better results at higher concentrations.

TABLE 1-continued

EXAMPLE	FUNGISTATIC TEST ON INERT MEDIUM				BACTERIOSTATIC TEST percentage decrease in <i>Escherichia coli</i> activity	
	7 DAYS		14 DAYS		(in %)	
	No.	Front	Back	Front	Back	after 1 h after 24 h
14		0	0	0	0	

[0203]

TABLE 2

EXAMPLE	FUNGISTATIC TEST ON INERT MEDIUM				BACTERIOSTATIC TEST				
	7 DAYS		14 DAYS		After 0 hours		After 24 hours		Antibacterial
	No.	Front	Back	Front	Back	F0i	Log(F0i)	F24i	Log(F24i) activity A
15		0	0	0	1	34100	4.53	0	0 -4.53
16		0	0	1	0	7200	3.86	0	0 -3.86
17		0	0	0	0	6300	3.80	0	0 -3.80
18		1	1	3	3	189000	5.28	0	0 -5.28
19		0	0	0	0	89000	4.95	0	0 -4.95
20		0	0	1	1	49500	4.69	0	0 -4.69
21		2	2	2	3	100000	5	0	0 -5

[0200] In particular, starting with a content of microbio-bidal agent.

[0201] The examples given are obviously not exhaustive and other basic carriers and other biocidal agents may be envisioned without departing from the field of protection of the patent.

[0202] In particular, the basic carrier may be a high-durability security paper which is the subject of patent application FR 2 814 476, a printing/writing paper, a tracing paper or a plastic note.

[0204] Fungistatic Test

[0205] Principle: the paper to be tested is placed on a sterile Petri dish, on an inert medium, providing the inside of the dish with moisture, and then seeded with an inoculum prepared with a mixture of activated strains.

[0206] The dishes are placed in an incubator at 28° C. for 14 days and are observed at 14 days.

[0207] I—Strains Used:

[0208] 10 Different Strains are Used:

TABLE 1

EXAMPLE	FUNGISTATIC TEST ON INERT MEDIUM				BACTERIOSTATIC TEST percentage decrease in <i>Escherichia coli</i> activity	
	7 DAYS		14 DAYS		(in %)	
	No.	Front	Back	Front	Back	after 1 h after 24 h
1		4	4	4	4	0 0
2		4	4	4	4	
3		2	3	4	4	
4		4	4	4	4	80.6 >99.9
5		4	4	4	4	80.6 >99.9
6		1	1	3	3	>99.9 >99.9
7		1	1	3	2	>99.9 >99.9
8		4	4	4	4	87.4 >99.9
9		4	4	4	4	92.7 >99.9
10		4	4	4	4	99.5 >99.9
11		4	4	4	4	>99.9 >99.9
12		1	1	3	4	
13		0	0	1	3	

- [0209] 1) *Chaetomium globosum*
 - [0210] 2) *Myrothecium verrucaria*
 - [0211] 3) *Stachybotrys atra*
 - [0212] 4) *Cladosporium herbarum*
 - [0213] 5) *Penicillium funiculosum*
 - [0214] 6) *Trichoderma viride*
 - [0215] 7) *Aspergillus niger*
 - [0216] 8) *Aspergillus flavus*
 - [0217] 9) *Aspergillus ustus*
 - [0218] 10) *Paecilomyces variotii*
- [0219] II—Storage of the Strains:
- [0220] The strains are stored in a refrigerator at between 3 and 5° C.

[0221] III—Trial:

[0222] A) Activation of the Strains

[0223] When a trial is programmed, the first operation consists in activating the strains, two weeks (between 14 and 16 days) before the test. In fact, since the strains are stored on a relatively non-nutritive medium, it is necessary to make them more active by culturing them on a more nutritive medium.

[0224] According to the strains, two media are used:

[0225] For *Chaetomium globosum*, *Stachybotrys atra*, *Cladosporium herbarum* and *Penicillium funiculosum*, the following medium is used:

Oat flakes	50 g
Branched agar	20 g
Distilled water	1000 ml

[0226] For the other strains, the following medium is used:

Moser malt	40 g
Mycological peptone	0.5 g
Branched agar	20 g
Distilled water	1000 ml

[0227] After 14 days, the strains are ready to be used.

[0228] B) Trial Media:

[0229] The medium is made up of:

NH ₄ NO ₃	3 g
KCl	0.25 g
MgSO ₄ 7H ₂ O	0.5 g
KH ₂ PO ₄	1 g
Agar	20 g
Water	1000 ml

[0230] The pH is adjusted to approximately 5.5.

[0231] It is an inert medium serving as a support for the test pieces.

[0232] The medium is sterilized for 30 minutes in a pressure cooker, in Erlenmeyer flasks with cottonwool stoppers, and then the agar is poured into sterile polystyrene dishes.

[0233] In parallel, an empty Erlenmeyer flask covered with a gauze and then with a cottonwool stopper and an Erlenmeyer flask containing 100 ml of distilled water are sterilized.

[0234] C) Initiating the Test

[0235] A minimum of two test pieces/face, i.e. four dishes/trial, are cut out.

[0236] They are placed separately in a small plastic bag until transfer into dishes.

[0237] The test pieces are disks 33 mm in diameter that are cut out using a hole-punch.

[0238] The test pieces are placed at the center of the dish on the agar, using forceps under rules of asepsis.

[0239] The dishes are labeled.

[0240] Preparation of the Inoculum:

[0241] The strains are mixed.

[0242] The concentration of each strain should be approximately 10⁶ (10⁵ to 10⁷), measured with a Thoma cell, which represents 1 to 10 conidia per square.

[0243] After verification of the concentration, the strains are mixed in the sterile empty Erlenmeyer flask and then in the spraying device sterilized beforehand with alcohol.

[0244] D) Inoculation

[0245] Using the spraying device, the entire surface is inoculated, i.e. test piece+agar.

[0246] E) Incubation

[0247] This is left to act for 14 days at 28° C. with water saturation.

[0248] IV—Results

[0249] The invasion of the paper is characterized using a marking system:

[0250] 0=>no attack

[0251] 1=>traces of fungal development

[0252] 2=>slight development (10 to 30%)

[0253] 3=>moderate development (30 to 60%)

[0254] 4=>strong development (>60%).

1) An information carrier intended to be handled relatively frequently, characterized in that it contains at least one biocidal agent.

2) The information carrier as claimed in claim 1, characterized in that it contains at least one bacteriostatic and/or bactericidal agent and/or at least one fungistatic and/or fungicidal agent.

3) The information carrier as claimed in claim 2, characterized in that it contains at least one bacteriostatic and/or bactericidal agent chosen from the compounds based on chitosan or chitin derivatives, on quaternary ammonium, on zinc zeolite, on silver ions and on triclosan.

4) The information carrier as claimed in claim 3, characterized in that it contains at least one bacteriostatic and/or bactericidal agent based on didecyltrimethylammonium chloride.

5) The information carrier as claimed in one of claims 2 to 4, characterized in that it contains at least one fungistatic and/or fungicidal agent chosen from the compounds based on isothiazolin or isothiazolone derivatives, on chitosan or chitin derivatives, on quaternary ammonium, on zinc zeolite, on silver ions and on triclosan.

6) The information carrier as claimed in claim 2, characterized in that it contains at least one fungistatic and/or fungicidal agent based on p-[(diiodomethyl)sulfonyl]toluol in the form of an aqueous dispersion.

7) The information carrier as claimed in claim 2, characterized in that it contains at least one fungistatic and/or

fungicidal agent based on iodopropynyl butyl carbamate in the form of an aqueous dispersion.

8) The information carrier as claimed in claim 2, characterized in that it contains at least one fungistatic and/or fungicidal agent based on methyl-1 H-benzimidazol-2-yl carbamate in the form of an aqueous dispersion.

9) The information carrier as claimed in claim 1, characterized in that the quantity by dry weight of biocidal agent in the carrier is less than 1%, and preferably less than 0.2%.

10) The information carrier as claimed in claim 1, characterized in that, after one hour of dynamic contact of the carrier with a strain of *Escherichia coli* or of *Staphylococcus aureus*, the percentage decrease in the activity of the corresponding strains is greater than 99.9%, under the conditions defined by the ASTM E 2149-01 method.

11) The information carrier as claimed in claim 1, characterized in that, after 24 hours of dynamic contact of the carrier with a strain of *Escherichia coli* or of *Staphylococcus aureus*, the antibacterial activity defined by the XPG 39010 method is negative.

12) The information carrier as claimed in claim 1, characterized in that it is based on cellulosic materials, in particular paper.

13) The information carrier as claimed in claim 1, characterized in that it is based on plastic materials.

14) The information carrier as claimed in claim 1, characterized in that it is intended for the production of a banknote, of a passport, of a playing card, of a chipcard, of a packaging, of a book or of a magazine.

15) A process for producing an information carrier as claimed in claim 1, characterized in that at least one biocidal agent is incorporated into a basic carrier made of cellulosic and/or plastic materials.

16) The production process as claimed in claim 15, characterized in that the incorporation of said biocidal agent is carried out by immersing said basic carrier in a solution of said biocidal agent.

17) The production process as claimed in claim 15, characterized in that the incorporation of said biocidal agent is carried out by spraying said basic carrier with a solution of said biocidal agent.

18) The production process as claimed in claim 15, characterized in that the incorporation of said biocidal agent is carried out by printing said basic carrier using an ink containing said biocidal agent.

19) The production process as claimed in claim 15, characterized in that the incorporation of said biocidal agent is carried out by surfacing said basic carrier with a solution containing said biocidal agent and an aqueous surfacing agent, the aqueous surfacing agent preferably incorporating glycerol as plasticizer.

20) The production process as claimed in claim 15, characterized in that the incorporation of said biocidal agent is carried out by coating said basic carrier with a coating solution containing said biocidal agent.

21) The production process as claimed in claim 15, characterized in that the incorporation of said biocidal agent is carried out by depositing onto said basic carrier an overprint varnish containing said biocidal agent.

22) The production process as claimed in claim 15, characterized in that the incorporation of said biocidal agent is carried out by coating microcapsules or cyclodextrin containing said biocidal agent onto said basic carrier.

* * * * *