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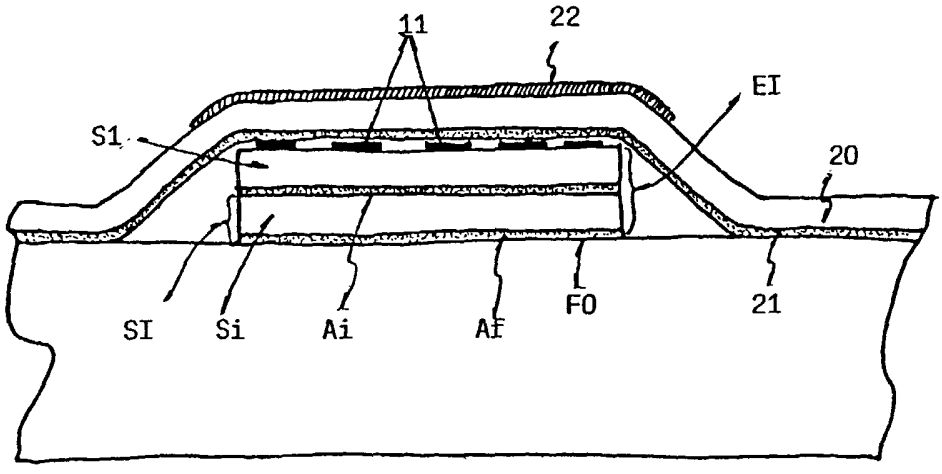
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(54) Title: INFORMATION PROTECTION SYSTEM



(57) Abstract: System for the protection of the secret information (11) to be associated to documents comprising a paper and/or plasto-elastomeric substrate, a lower label (EI) carrying on at least one zone thereof, said information (11), an upper label (ES) for the protection of said information, each label comprising at least a support (Si) and an adhesive layer (Ai). Said lower label (EI) comprises n supports (n being higher than 2), said information being associated to that of said supports nearer to the upper label, a number of adhesive layers at least equal to said n, and only one opaque scratchable layer (22) on the top of said upper label (ES).

WO 03/106191 A1

Title: Information protection system.

DESCRIPTION

Background of the invention

The present invention concerns system to protect secret information (such as codes, indentifications, authentications, PINS, indicia and the like) by an at least partially removable cancealing or masking with the aid of one or more covering material layers.

In one particularly efficient and reliable embodiment, the invention concerns a multilayer system at least comprising backing layers, adhesive layers and covering removable layers; all layers being coordinated through adhesion force gradients.

Prior Art

It is known the strong developement of means, devices, apparatus and the like of information, communication, play, payement etc., such as cards, tickets, checks and the like, to which is to be associated an identification message particularly in the form of code, hologram, indicia etc.

These protection systems may knowingly consist of a simple rubbing (scratch-off) layer of the type "scratch-and win", or of complexe multilayer means in form of stamps, labels and the like.

The protections by means of the type of labels and the like are per sè known since about thirty years (see, among others, the old US Patents N° 3,829,133, N° 3,950,013, N°4,278,199 etc.).

However these first old (rather ingenuous) systems had to undergo substantial evolutions to be able to face the always more sophisticated tampering techniques. These techniques of abuses in the information descovering or access can go from the so called candling (code lecture with

the aid of intense and/or sophisticated lights) to the detachement of at least one of the covering layers (label), followed by a skilled repositioning of the detached label for the very short time needed to the code lecture.

On the other hand are also known the problems (mainly technological) which must be faced in the application and spreading (f.i. in situ) of adhesive layers (having differentiated seal forces) of scratchable opaque materials etc..

Still as a further example, more or less sophisticated labels are described in the German Patent N° DE 1.970.538.0 (granted on June 10, 1998), in the European Patent Publications EP N° 0896.296 and N° 0668.092, in the French Patent Publication FR N°2.780.339, in the British Patent Publications GB N° 2.305.393, N° 2.252.270, N° 2.355.431 and N° 2.243.578, and in the International Patent Publications WO N°96/40395 and N° 97/10957.

In the European Patent Publication EP N° 0974.951 (corresponding to the US Patent N° 6,358,607) a label is described comprising an adhesive layer, a substrate (generally consisting of a transparent film) and at least one scratchable opaque layer. The secret information can be on the substrate, on an opaque ink film or veil or between said transparent film and the scratchable layers. In said EP Patent Publication N°0974951 as well as in several other Patents such as EP N° 0668.092, EP N° 1.090.774, Italian Patent Application MI99A 002295 etc., on the card or ticket substrate is applied (preferably with the aid of an adhesive) a layer of opaque (preferably scratchable) ink on wich is printed the information that is thereafter protected by a transparent protective layer on the top of which is applied the scratchable opaque layer.

Being well kown the equivalence between combinations of- an adhesive layer; - a trasparent layer and -a scratchable layer applied in succession in situ, on one hand and, on the other hand, a label comprised of said preformed layers, a system is obtained which has the configuration of two superposed labels.

All the prior systems in particular those consisting of two labels applied in successive steps are not free of inconveniences. Among the major disadvantages it must be emphasized the fact that the opaque scratchable ink film or veil associated to the lower label and carrying the secret information, is pulled (taken in tow) by said upper label when this one is submitted to detachement attempts. In other words, even if it is true that by imparting to the adhesive layer between lower label and card substrate, a sealing force stronger than that of the layer between upper label and information, the towing of the information carrying ink film can still occur but it can offen (if not, always) be uncomplete in the sense that at least a portion of the pulled veil is broken in small pieces leaving uncovered at least a (sometimes, significant) portion of the code or secret information.

Moreover said conventional systema require additionally the opaque ink film or veil on which the code is to be printed. The conventional system of two labels shows therefore an additional spurious element i.e. the lower ink film or veil which besides being an eterogeneous redundantly additional element, forms just the achilles' heel thereof.

Summary of the Invention

The first object of the present invention is to provide a system which avoids the prior art inconveniences in particular by totally eliminating

the additional code carrying film.

According to a first feature of the invention the above mentioned Achille's heel is thereby eliminated and moreover the technological difficulties are avoided which are encountered in the drawing of said delicate opaque ink scratchable film on the card substrate.

An other object of the invention is to provide a method for the preparation of the multilayer system of this invention, in which method is no more present the delicate phase of the application of scratchable opaque ink films on the complexe lower label.

According to a first advantageous feature of the invention the lower label which is conventionally made opaque with the aid of said (now) redundant ink or veil is now rendered opaque thanks to the introduction of higly opacizing elements in at least one of the two layers of the lower label base. This opacizing of at least one of the lower label backings is a technologically and economically simpler, more reliable and reproducible operation than that obtained by the conventional spreading of an ink or veil.

These advantages are enhanced by using opacized adhesive (f.i. black adhesives) which allow the use of any kind of backing of same opacized adhesives.

In a further embodiment of the invention the lower layer on the inferior label is advantageously in the form of a bi-adhesive stripe. In this case the manufacture of the whole label requires a substantially minor number of the production machine passages or strokes.

Indeed the opacizing by the addition (in at least one of the two elements forming the lower label) of pigments, carbon black, dyes etc. is not only

per sè easier but is additionally suitable to the realization of opaque shades according to the (each-time) desired exigences.

Therefore the multilayer system according to the invention is characterized in that there are: - at least two substrates in the lower label, in the absence of any veil of scratchable opaque ink code carrying film; - and a total of at least three adhesive layers, the sealing forces of which are now easier to control in order to obtain with the maximum security the obscurity of the code even in the case of any detaching attempt of the upper label from the lower label which consists now of n layers. In any case in the system according to the invention the towing by the upper label of the code carrying layer of the lower label occurs always with the maximum security.

The main characteristics of the invention are recited in the claims which are at the end of this description but are to be considered also herein incorporated.

Brief Description of the Drawings

The various features and advantages of the invention will more clearly appear from the following description of the illustrative and not limitative embodiments shown in the accompanying drawings in which:

- figure 1 is a schematic compacted cross-section of a card in which the opacizing pigments are in at least one of the n backing layers Si, and not in the adhesive layers Ai, Af etc.;
- figures 1A, 2 and 3 are schematic enlarged and exploded cross- sections of the card of fig. 1, fig. 1A corresponding to fig. 1, fig. 2 showing opacized adhesive layers, and fig. 3 showing a transparent bi-adhesive

stripe BAS comprising the last lower support Ss and the relevant clear adhesive Af.

In these figures the substrate of the document according to the invention is indicated by the reference SU whereas the references EI and ES indicate the lower and upper label respectively.

This last upper label ES comprises conventionally the backing layer 20 having inferiorly the adhesive layer 21 and superiorily the scratchable opaque layer 22.

Same upper label ES consisting of these three basic elements with or without additives of various nature is of the type extensively commercialized and therefore does not need further description details; for instance labels marketed by producers EUROLABEL, ARCA ETICHETTE, SCHREINER etc. can be utilized as upper label ES.

Characteristically the lower label EI is different from the upper label ES not only because of the absence of an opaque ink scratchable layer (equal or different from the layer 22) but also, and above all, because the backing substrate SI comprises now several elementary supports S1, S2...Sn and several adhesive layers An i.e. A1, A2...Ai..Af. For illustrative clarity sake, in the drawings has been shown the most elementary case comprising only two (n = 2) partial substrates Ss and Si of SI between which is present the intermediate adhesive layer Ai. The bottom (lower face of SI) FO of said lower support Si shows the adhesive layer Af. Typically said lower adhesive layer Af is characterized by a "maximum maximorum" of adhesion to the paper- or plasto- elastomeric substrate SU of the card.

Particularly and significantly the adhesion of Af is higher than the

adhesion of layer 21 between upper label ES and code 11, directly on the support Ss of label EI. On its turn the adhesion excerted by said layer 21 is higher than the adhesion excerted by the intermediate adhesive layer Ai.

When the partial supports of the lower label are above two, remains still valid the condition that the adhesion Af is the maximal, the adhesion of layer 21 is lower than that of Af however it is higher than that between all the intermediate adhesive layers of the remaining n-1 partial supports which can be equal or different to/from each other, however it must always respect the criterium that the upper layer Ss of the lower label EI is to be always taken in towing by the upper label ES. The adhesive layer Ai can be brought about by an adhesive with release effects i.e. with a well determined adhesion threshold above which the detachement occurs automatically.

In figure 2 is shown the embodiment in which the adhesive layer Ai associated to backing S1 = Ss is opacized, preferably is a black adhesive whereby the opacizing of SS is brought about without the need to incorporate pigments into S1 (or other equivalent supporting layer). One of the most significant advantage is obtained in that the material forming S1 can be chosen from broad ranges of backing materials (even those not receptive to pigments).

In figure 3 the lower layer SI is a bi-adhesive stripe BAS which is manufactured with a very low machine passages amounting to a cost effective reduction (from 15-30%). Moreover laboratory tests have prooved that the release between said BAS and the adjacent upper layer is optimized.

The methods (as recited in the claims) to manufacture the cards of the invention are very effective in particularly for the elimination of the steps

to apply the ink film and print thereupon the code by opacizing the support layers or, preferably, by using opacized adhesives such as black adhesives, much better if associated to so-called bi-adhesive stripes.

Obviously the system and relevant method according to the invention are susceptible of all the various modifications, substitutions and the like which are in the reach of a mean skilled person, and therefore fall naturally in the scope and spirit of said invention.

CLAIMS

1. System for the protection of secret information to associate to documents such as cards (smart-, prepaid-, playing-cards and the like) checks, ticket, play.... etc. comprising a paper and/or plasto-elastomeric substrate, a lower label carrying, on at least a zone thereof, said information, an upper label for the protection of said information, each label comprising at least a support and an adhesive layer, characterized in that: said lower label comprises: - n supports n being at least equal to two and said information being associated to the one of said n supports nearer (proximal) to said upper label; - as well as a number of adhesive layers at least equal to n; - and in that there is only one scratchable opaque layer on the top of said upper label.
2. System according to claim 1, characterized in that at least one of said n supports of said lower label is at least partially opacized by additives such as pigments, dyes, carbon black.
3. System according to claim 1, characterized in that at least one of the adhesive layers (Ai and/or Af) is opacized, in particular is a black adhesive.
4. System according to claim 1, characterized in that at least the lower layer SI is in the form of a bi-adhesive stripe.
5. System according to claim 1, characterized in that said n adhesive layers have adhesive force gradients.
6. System according to claim 5, characterized in that the adhesive layer between the last one of said n supports of the lower label and said paper and/or plasto-elastomeric substrate has an adhesive force much higher than that of the other n-1 layers.

7. System according to at least one of the preceding claims, wherein the adhesion between support couples is lower than that between said upper label and said secret information present on said support on top of said lower label.
8. System according to at least one of the preceding claims, characterized by a lower label consisting of at least two superposed backing layers bonded by an adhesive layer having an adhesion lower than not only that between substrate and bottom support but also than that of the adhesive layer between the upper label and said support which is on the top of the lower label, and carries the information.
9. System according to at least one of the preceding claims, characterized in that in case of attempts to detach the upper label from the lower label, the towing of the upper support of said lower label and the unmovability of the bottom support of same lower label, take always place.
10. System according to at least one of the preceding claims, characterized in that the sole opaque scratchable layer present on said upper label top contains elements customizable with logos, holograms, written words and/or photochromic elements, and/or elements sensitive to Wood's radiations.
11. Method for the production of multilayer systems for the protection of secret information according to the preceding claims, characterized in that on the substrate of a conventional document is applied a lower label comprising several layers of partial support bonded to each other by adhesive forces with or without sealing gradients, the adhesive layer of

the bottom partial support has the adhesive layer with the maximum sealing force, on the top partial support is applied the secret information without the interposition of scratchable opaque ink veil or film, and said information so applied directly on the partial support is protected with a conventional label having a non-opacized support, on which are applied, on one side, a layer bonded to the secret information, and on the other side, the sole scratchable opaque layer of the system.

12. Method according to claim 11, in which an already opacized adhesive is applied on the layers forming the whole lower label (EI).

13. Method according to claim 11, in which said lower backing layer (SI) is in the form of a bi-adhesive stripe.

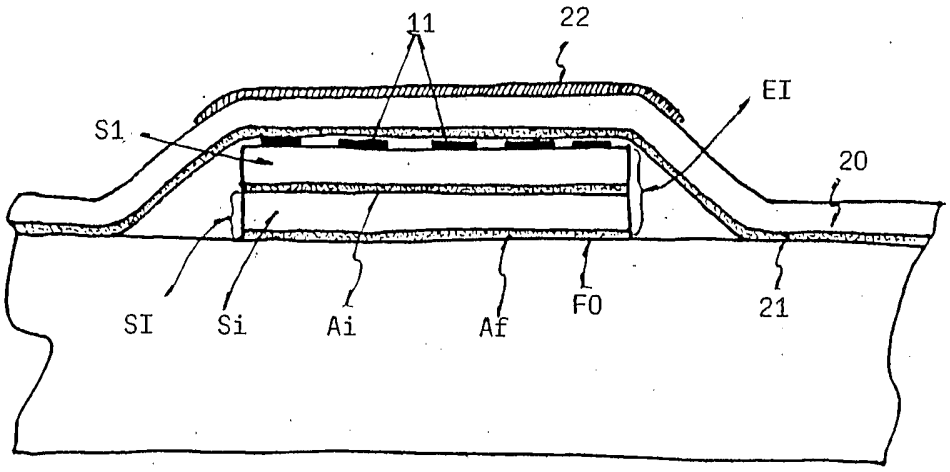

11
22
EI
S1
20
SI
Si
Ai
Af
F0
21

FIG. 1

Fig. 1A

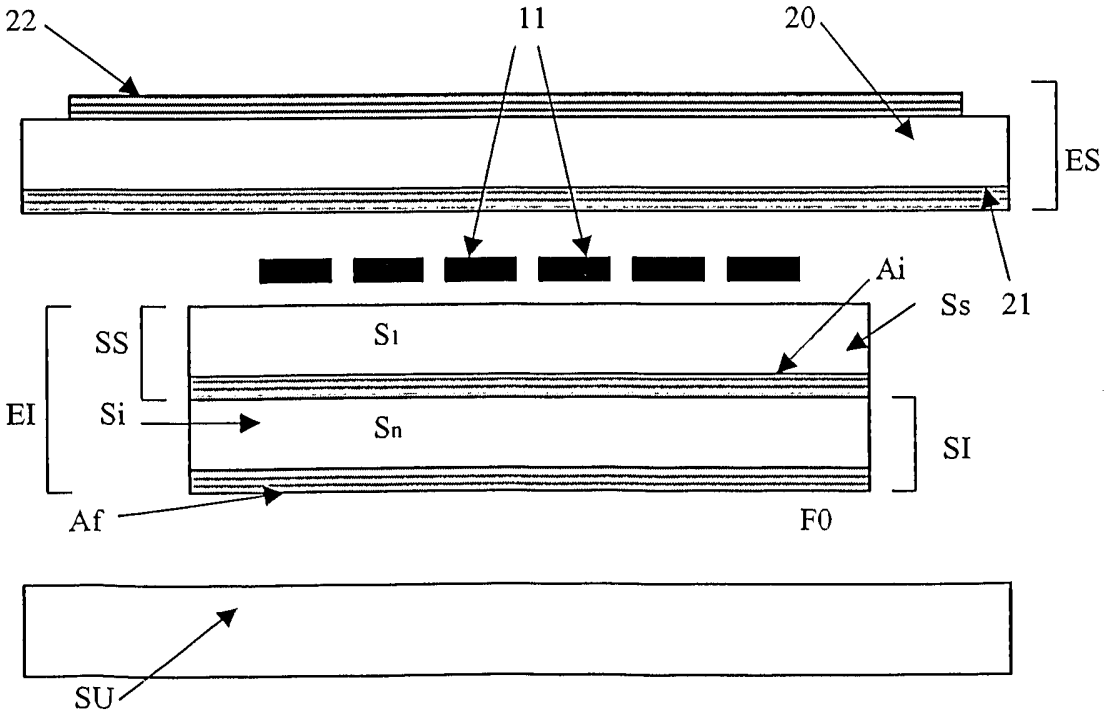

22
11
20
ES
Ai
Ss
21
SS
Si
EI
Sn
SI
Af
F0
SU

Fig. 2

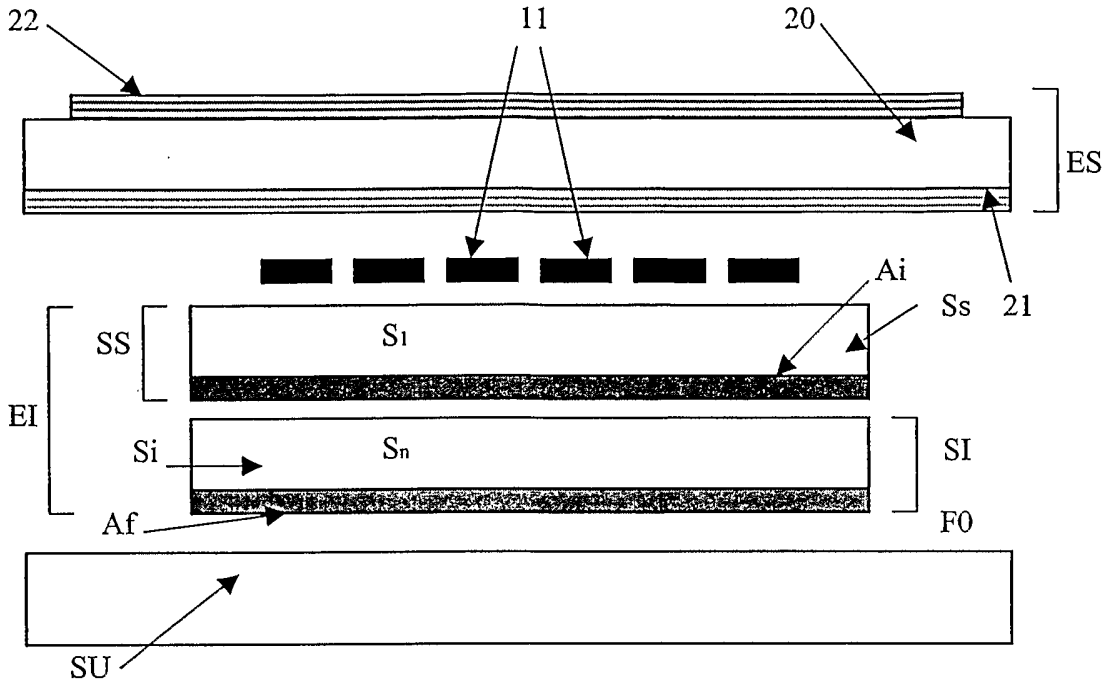
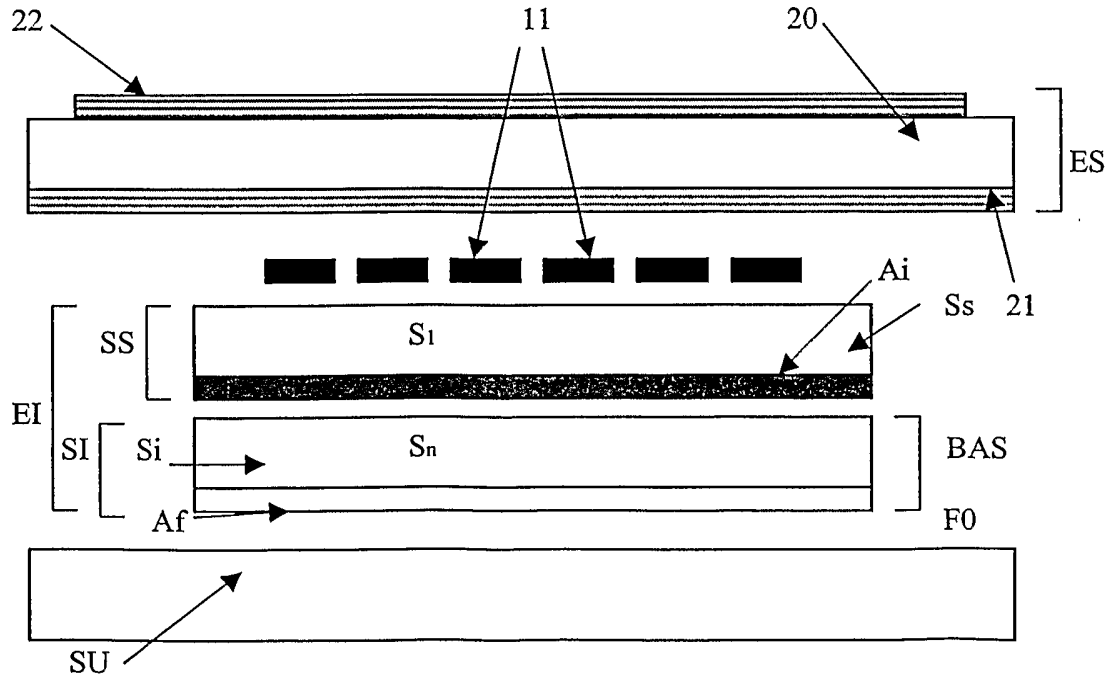

22
11
20
ES
Ai
Ss
21
SS
S1
EI
Si
Sn
SI
Af
F0
SU

Fig. 3


22
11
20
ES
Ai
Ss
21
SS
S1
EI
SI
Si
Sn
BAS
Af
F0
SU

INTERNATIONAL SEARCH REPORT

International Application No
PCT/IT 02/00655

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B42D15/10 B42D15/00 G09F3/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B42D G09F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2001/023895 A1 (SPOONER ANDREW ET AL) 27 September 2001 (2001-09-27) page 1, paragraph 8 -page 2, paragraph 14; figures	1,11
A	US 4 591 190 A (CLARK FRED C) 27 May 1986 (1986-05-27) column 5, line 54 -column 11, line 36; figures	1,11
A	FR 2 780 339 A (NARBONI ETS) 31 December 1999 (1999-12-31) cited in the application the whole document	

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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INTERNATIONAL SEARCH REPORT

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 090 774 A (VENTURINI & C S P A) 11 April 2001 (2001-04-11) cited in the application the whole document -----	

INTERNATIONAL SEARCH REPORT

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