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(71) Applicant *(for all designated States except US)*: **SCIENTIFIC GAMES HOLDINGS LIMITED** [IE/IE]; Athlone Road Ballymahon Co. Longford, Dublin 4 (IE).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **IRWIN, JR., Kenneth, Earl** [US/US]; 2141 War Hill Park Road, Dawsonville, Georgia 30534 (US). **STREETER, Gary** [US/US]; 35 William Street, Andover, Massachusetts 01810 (US).

(74) Agent: **BONDURA, Stephen, E.**; Dority & Manning, P.A., P O Box 1449, Greenville, SC 29602-1449 (US).

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[Continued on next page]

(54) Title: METHOD FOR PREVENTING AND DETECTING TAMPERING OF SCRATCH-OFF COATINGS ON SUBSTRATES, AND ASSOCIATED SUBSTRATES

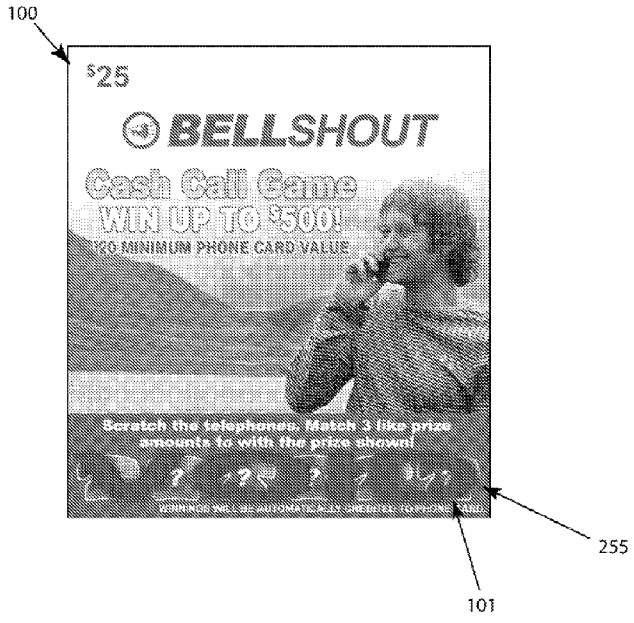

FIG. 8

(57) Abstract: A method (and associated substrate) is provided for deterring and detecting fraudulent removal of a scratch-off coating (SOC) from a substrate having a scratch-off area. A scratch-off coating is applied over the scratch-off area. An overcoat material is applied over the scratch-off coating. The overcoat material is formulated with a reactant that reacts with chemicals used in assisted mechanical lift attempts and produces a visual indication of the use of such chemicals in an attempt to tamper with the SOC to discern images or indicia underlying the SOC.

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METHOD FOR PREVENTING AND DETECTING TAMPERING OF SCRATCH-OFF COATINGS ON SUBSTRATES, AND ASSOCIATED SUBSTRATES

PRIORITY CLAIM

[0001] The present application claims priority to U.S. Provisional Application Serial No. 61/340,806, filed March 23, 2010.

FIELD OF THE INVENTION

[0002] The present disclosure relates in general to methodologies for securing scratch-off lottery tickets and commercial tickets/coupons against assisted and unassisted mechanical lifts and reapplication, as well as a method for protecting against the fraud of recycling losing tickets by the reprinting of a Scratch-Off-Coating (SOC). The proposed methodologies allow for enhanced security without any increase in cost as well as no significant impact on the consumer's play experience.

BACKGROUND OF THE INVENTION

[0003] Lottery scratch-off or instant games have become a time-honored method of raising revenue for state and federal governments the world over. Indeed, the concept of hiding indicia information under a Scratch-Off-Coating (SOC) has also been applied to numerous other products such as commercial contests, telephone card account numbers, etc. Literally, billions of scratch-off products are printed every year where the integrity of their Scratch-Off-Coatings (SOCs) is used to ensure that the product has not been previously used, played, or modified. Thus, the integrity of the SOC is paramount to ensure that a game or product is secure.

[0004] Unfortunately, there are known techniques that can mechanically "lift" the SOC and thereby compromise the integrity of scratch-off products. The term 'mechanical lift' refers to a process that uses a flat blade (e.g., X-Acto chisel blade #17) or other device to peel back a portion of a Scratch-Off-Coating (SOC) to reveal previously hidden indicia. The SOC is then glued back into place such that it is not obvious that the integrity of the coating has been breached. The industry has developed countermeasures to the previously described mechanical lift technique which involve changing the

formulation of the SOC so that it is more difficult to remove and/or it flakes off or crumbles rather than peeling off in one piece, thereby making "unassisted" SOC lifts more difficult. However, these techniques have done little to alleviate the vexing problem of "assisted" SOC lifts. Assisted lifts differ from unassisted lifts in that another medium or material is applied to the SOC (e.g., Krylon acrylic clear spray) to strengthen it, thereby "assisting" anyone who is attempting a mechanical lift.

[0005] Another form of fraud involves completely removing the SOC, viewing the indicia, and then reprinting a new SOC on the non-winning products (via silk screen or other printing methodology) that is similar in appearance to the original SOC such that an unsuspecting customer would purchase the modified product assuming it is pristine.

[0006] Thus, it is highly desirable to develop improved methodologies for ensuring the integrity of a SOC against lifts and reapplication, as well as enhancing the product's resistance to complete SOC removal and reprinting.

BRIEF DESCRIPTION OF THE INVENTION

[0007] Aspects and advantages of the invention will be set forth in part in the following description, or may be obvious from the description, or may be learned through practice of the invention.

[0008] Described are a number of methodologies that provide practical details for reliably protecting the integrity of the SOC from mechanical lifts, SOC reapplication, and SOC reprinting.

[0009] In a particular embodiment, a method is provided for deterring and detecting fraudulent removal of a scratch-off coating (SOC) from a substrate having a scratch-off area. A scratch-off coating is applied over the scratch-off area. An overcoat material is applied over the scratch-off coating. The overcoat material is formulated with a reactant that reacts with chemicals used in assisted mechanical lift attempts and produces a visual indication of the use of such chemicals in an attempt to tamper with the SOC to discern images or indicia underlying the SOC.

[0010] In one embodiment, the overcoat material contains a dye that chemically reacts with the assisted mechanical lift chemicals.

[0011] In another embodiment, the overcoat material includes an ink wherein the chemical reaction causes the ink to dissolve, bleed, run, thin or otherwise alter in appearance to indicate tampering with the SOC.

[0012] The overcoat material may be formulated to react with assisted mechanical lift chemicals including ketones, esters and petroleum distillates.

[0013] The present invention also encompasses any manner of substrate that incorporates aspects of the methods described herein. In a particular embodiment, a substrate is provided with a scratch-off area, a scratch-off coating applied over the scratch-off area, and an overcoat material applied over the scratch-off coating. The overcoat material includes a reactant that reacts with chemicals used in assisted mechanical lift attempts (including ketones, esters and petroleum distillates) and produces a visual indication of the use of such chemicals. For example, the reactant may be a dye that chemically reacts with the assisted mechanical lift chemicals, or an ink wherein the chemical reaction causes the ink to dissolve, bleed, run, thin or otherwise alter in appearance to indicate tampering.

[0014] These and other features, aspects and advantages of the present invention will become better understood with reference to the following description and appended claims. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and, together with the description, serve to explain the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] A full and enabling disclosure of the present invention, including the best mode thereof, directed to one of ordinary skill in the art, is set forth in the specification, which makes reference to the appended figures, in which:

[0016] FIG. 1 is a front plan view of a first representative example of a lottery-type instant ticket where a mechanical lift has been attempted and the SOC was not reapplied in register;

[0017] FIG. 2 is a front plan view of a first representative example of a lottery-type instant ticket where a Benday-type pattern overprint greatly increases the difficulty of lifting and reapplying or reprinting the SOC;

[0018] FIG. 3 is a front plan view of the first representative example of FIG.2 where a lift/reapplication has been attempted but the miss-registered Benday pattern makes the attempt clearly visible;

[0019] FIG. 4 is a front plan view of the first representative example of FIG.2 where a complete SOC replacement (or reprint) has been attempted but the mis-registered Benday pattern makes the attempt clearly visible;

[0020] FIG. 5 is a front plan view of the first representative example of a non-continuous release coating film application in a typical scratch-off ticket ink film layer;

[0021] FIG. 6 is a cross section view of the second representative example of a release coating film with an irregular surface application in a scratch-off ticket ink film layer;

[0022] FIG. 7 is a cross section view of the third representative example of a release coating film with an irregular surface application in a scratch-off ticket ink film layer; and

[0023] FIG. 8 is a front plan view of the first representative example of a scratch-off ticket with a special coating to chemically detect assist agents.

DETAILED DESCRIPTION OF THE INVENTION

[0024] Reference now will be made in detail to embodiments of the invention, one or more examples of which are illustrated in the drawings. Each example is provided by way of explanation of the invention, not limitation of the invention. In fact, it will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the scope or spirit of the invention. For instance, features illustrated or described as part of one embodiment can be used with another embodiment to yield a still further embodiment. Thus, it is intended that the present invention covers such modifications and variations as come within the scope of the appended claims and their equivalents.

[0025] Whether attempting a mechanical lift/reapplication or reprinting a new SOC coating, the perpetrator's principal challenge is the

reapplication of the lifted SOC, or reprinting of a new SOC material, such that the SOC remains in registration with the graphics on the rest of the ticket. If registration is not maintained between the lifted/new SOC and the rest of the ticket, the product would appear modified or defective. For example, FIG. 1 illustrates a lottery ticket 100 where the scratch-off area 101 SOC has been mechanically lifted in six places 102, but not reapplied into proper registration with the other graphics on the ticket.

[0026] Regrettably, after some practice, a skilled technician can perform SOC lifts and replacements with little impact in registration on most tickets such that the ticket would pass as pristine under normal inspection. However, the ability for the skilled technician to perform these SOC lifts and replacements without detection varies with ticket design, with more complex graphics in the scratch-off area(s) greatly increasing the difficulty. For example, a photographic reproduction of people or familiar objects in the scratch-off area(s) of a ticket makes it practically impossible to perform a mechanical lift/reapplication without leaving a telltale mark. The problem with this approach is that it is difficult to maintain an environment conducive to low cost photographic reproduction. Additionally, if the photographic image is confined to only the scratch-off area of the ticket with a clear delineation between the scratch-off area and the rest of the ticket (for example, provided by a border as is typical in scratch-off ticket graphic design), completely reprinting the removed SOC remains viable, because the graphic scratch-off border helps mask any out-of-register condition.

[0027] If the photographic image is extended beyond the scratch-off area, with the delineating scratch-off graphic border reduced in intensity (e.g., screened half tone or dashed line), reprinting a removed SOC via lithographic methods becomes un-viable since registration with the ticket substrate image would be exceedingly difficult. This same concept, of bridging the graphics over the scratch-off area and surrounding ticket substrate, can be expanded to simpler designs (e.g., Benday patterns) that accomplish the same registration challenges for the lift/replacement attack without the added costs of printing photographic images over the scratch-off area(s) of a ticket. Thus, in this preferred embodiment, low cost production and miss-registration detection methods are both incorporated into the same product.

[0028] FIG. 2 illustrates an example of this preferred embodiment. In FIG. 2, the six scratch-off areas 101 of the ticket 100 all include Benday overprints 111 that cover both the scratch-off areas 101 as well as a portion of the background ticket substrate 103. By covering both the scratch-off areas as well as the ticket substrate, the fine lines of the Benday patterns make registration exceedingly difficult to effectively hide both the SOC lift/reapplication and the reprinting of SOC.

[0029] FIG. 3 provides an illustration of how the Benday patterns 111 provide a ready visual indication 115 that a mechanical lift/reapplication has been attempted in the six scratch-off areas, even to someone that is not necessarily aware of the technique. FIG. 4 illustrates how the same Benday patterns 111 would also protect against reprinting of the entire SOC in the six scratch-off areas, by readily showing a registration failure 260 between the replacement SOC and the ticket substrate 103 that is not apparent in non-tampered tickets.

[0030] Of course there are numerous other variations of this preferred embodiment (e.g., photographic pictures, fingerprint patterns, water flow patterns, etc.) that are obvious to anyone skilled in the art and may under some circumstances be more desirable than the previously disclosed embodiment.

[0031] In alternative embodiment, protection of the integrity of the SOC can be provided by alterations to the release material associated with the SOC rather than by an elaborate overprint. Scratch-off tickets typically employ a release coating layer beneath the SOC opaque and decorative layers. The release layer, as its name implies, causes any coatings placed over it to easily scratch-off. The physical nature of the scratch-off coating varies from manufacturer to manufacturer (e.g., wax base, UV coating, etc.) and has been documented in numerous other patents as well as many public domain documents and is not essential to the present description. In known applications, however, the release layer is specified as a continuous film providing a foundation from which all subsequent layers of ink film will scratch-off, allowing for the one-time reveal that is typical of scratch-off tickets. The problem with this homogeneous continuous release film,

however, is that it provides an excellent base for SOC mechanical lifts and/or replacement of the SOC by devious means.

[0032] Thus, a release film with partial coverage causes the SOC to release easily from some areas and not at all from others, thereby making it difficult if not impossible to lift or reprint the SOC even with mechanical assists. In one possible embodiment, the release film 200 is applied as illustrated in FIG. 5 with a pattern of dots (holes) 201 in which no release film is present. In this embodiment, if the dots 201 are small enough they will not hinder the normal scratching process or obscure the imaged indicia. However, the presence of a non-continuous release film with holes large enough to prohibit lifting of the SOC will greatly hinder or render impossible mechanical lifting of the SOC due to the dotted areas with no release that would effectively block a sharp X-Acto or razor blade from raising a smooth film. Additionally, the pattern of dots (holes) 201 would also make it extremely difficult to reapply a new SOC to the scratched off area(s) due to registration problems with the SOC overprint and the multiplicity of dots. Of course there are many possible patterns obvious to anyone skilled in the art that might perform better than the previously described dots and in some instances may be more desirable, but for the sake of brevity, only the dot pattern is described in for this particular embodiment.

[0033] In yet another embodiment, rather than a pattern of holes or lines with no release present in the film, the same effect of making the film resistant to mechanical lifts and/or replacement of SOC can be accomplished with an irregular or rough release film surface. FIG. 6 illustrates an irregular or rough SOC film 202, printed on a ticket substrate 103, above the win or lose indicia 252, with opaque and decorative overprints 253 printed on top of the irregular release film 202. In this embodiment, the irregular release film surface 202 when initially applied and not completely cured allows for subsequent SOC ink film layers to flow into the irregular surfaces forming a homogeneous and opaque covering 253. The irregularities in the release film may be generated by planned deformities in the Flexographic printing plate (or other type of printing) that applies the release film to the ticket substrate 103. In this embodiment, the rough/irregular surface of the release film 202 is not so irregular that it significantly impacts removal of the SOC by normal

consumer scratching with a relatively blunt coin or other object. However, when a perpetrator attempts to lift the SOC via assisted or unassisted means, the rough/irregular surface of the release film 202 functions as a series of 'speed bumps' that repeatedly catch the sharp edge of the X-Acto or razor blade typically used in mechanical lifts causing the blades to jerk and not lift a continuous patch. Additionally, while the irregular release film surface 202 does allow removal of the majority of the SOC 253 with blunt coins and other objects (e.g., fingernail), it does allow for microscopic parts of the SOC 253 to remain. While these microscopic SOC remnants are not sufficient to significantly impact viewing of the revealed play indicia 252, the remnants do intermingle with any fresh SOC ink coating(s) reapplied to a played ticket, such that the resulting ink films appear tampered with and would be unlikely to be accepted by a consumer as pristine.

[0034] In still another embodiment, the release film coating thickness can be varied, producing a series of plateaus, which halt or disrupt any mechanical lifting attempts. In this embodiment, shown in FIG. 7, the release film 203 is applied in multiple levels, resulting in a series of planes to which the SOC ink film(s) 253 are applied. The multiple levels of release coating could be achieved by altering the line screen on a single Flexographic printing plate or by the application of multiple printing plates.

[0035] In the special case of preventing assisted mechanical lifts, the chemical nature of the spray-on assist material can be used to trigger a reaction on the ticket's scratch-off surface. For example, Krylon clear spray contains keytones, petroleum distillates, toluene, naphthalene, acetone, and ethyl 3-ethoxypropionate. Dyes exist that responds to one of these ingredients. These dyes could be applied as an overcoat to the ticket's scratch area and serve as an obvious indication of attempted "assisted lift" tampering. FIG. 8 provides an exemplary illustration of this embodiment. In FIG. 8, the lottery ticket 100 has special dyes 255 that are sensitive to one of the key ingredients in the assisted lift medium (e.g., Krylon). As shown, when the ingredients from the assisted lift medium contact the dyes in the scratch-off area 101 overprint, a chemical reaction occurs causing the dyes to become visible, with the word 'VOID' 255 appearing in this example. Of

course the chemical reaction, could cause the ticket's ink to dissolve, bleed, run, thin, or otherwise dramatically alter in appearance to indicate tampering.

[0036] While the aforementioned chemical reaction methodology is only affective against assisted mechanical lifts, it can be used in addition to some of the other techniques described in this application to provide a more robust defense against ticket fraud.

[0037] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. It is intended that the present invention include such modifications and variations as come within the scope of the appended claims.

WHAT IS CLAIMED IS:

1. A method for deterring and detecting fraudulent removal of a scratch-off coating (SOC) from a substrate, comprising:

forming a substrate comprising at least one scratch-off area;

applying a scratch-off coating over the scratch-off area;

applying an overcoat material over the scratch-off coating; and

wherein the overcoat material is formulated with a reactant that reacts with chemicals used in assisted mechanical lift attempts and produces a visual indication of the use of such chemicals.

2. The method of claim 1, wherein the overcoat material contains a dye that chemically reacts with the assisted mechanical lift chemicals.

3. The method of claim 1, wherein the overcoat material includes an ink wherein the chemical reaction causes the ink to dissolve, bleed, run, thin or otherwise alter in appearance to indicate tampering.

4. The method of claim 1, wherein the overcoat material is formulated to react with assisted mechanical lift chemicals including ketones, esters and petroleum distillates.

5. A substrate, comprising:

a scratch-off area;

a scratch-off coating applied over the scratch-off area;

an overcoat material applied over the scratch-off coating; and

wherein the overcoat material comprises a reactant that reacts with chemicals used in assisted mechanical lift attempts and produces a visual indication of the use of such chemicals.

6. The substrate of claim 5, wherein the overcoat material comprises a dye that chemically reacts with the assisted mechanical lift chemicals.

7. The substrate of claim 5, wherein the overcoat material comprises an ink wherein the chemical reaction causes the ink to dissolve, bleed, run, thin or otherwise alter in appearance to indicate tampering.

8. The substrate of claim 5, wherein the overcoat material is formulated to react with assisted mechanical lift chemicals including ketones, esters and petroleum distillates.

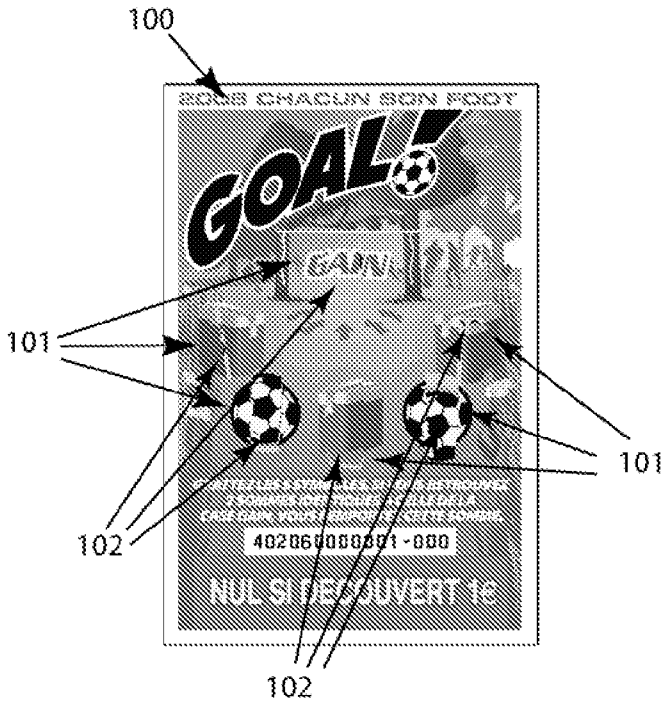

FIG. 1

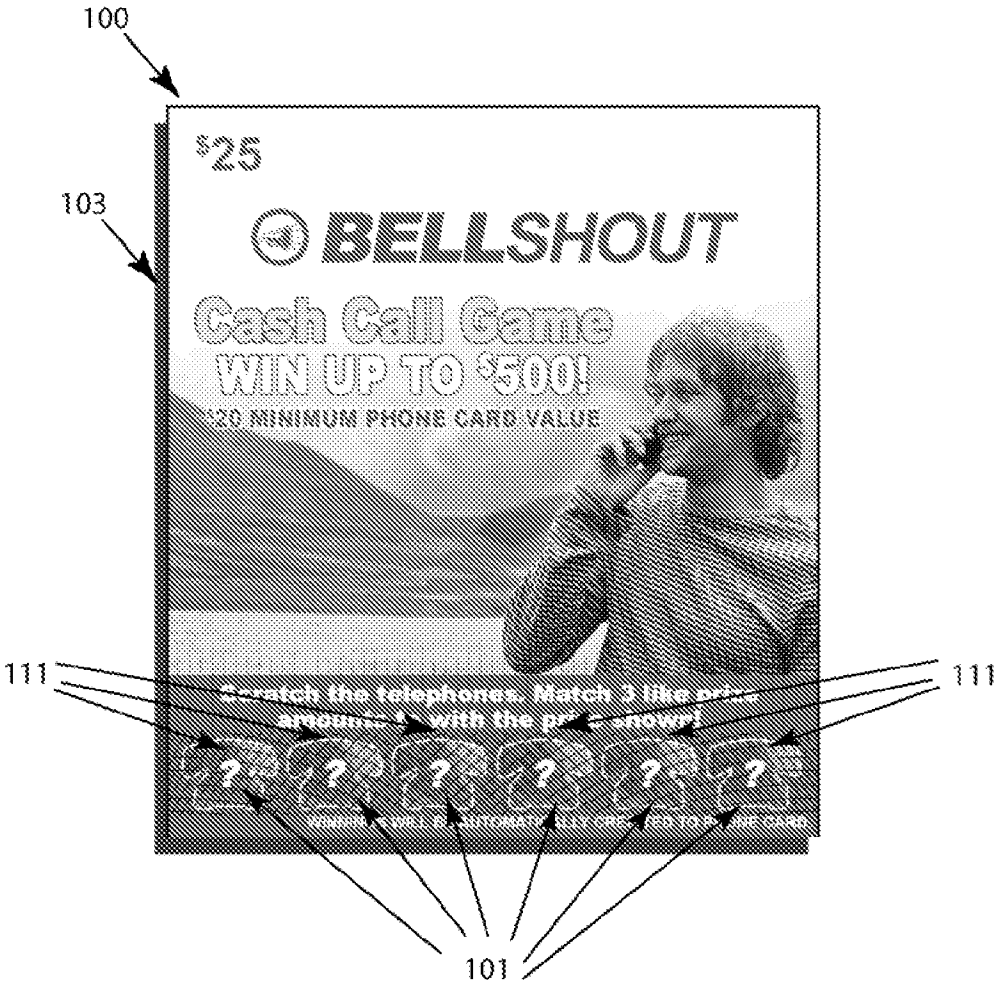
100
103
$25
BELLSHOUT
Cash Call Game
WIN UP TO $500!
*$20 MINIMUM PHONE CARD VALUE
111
111
101

FIG. 2

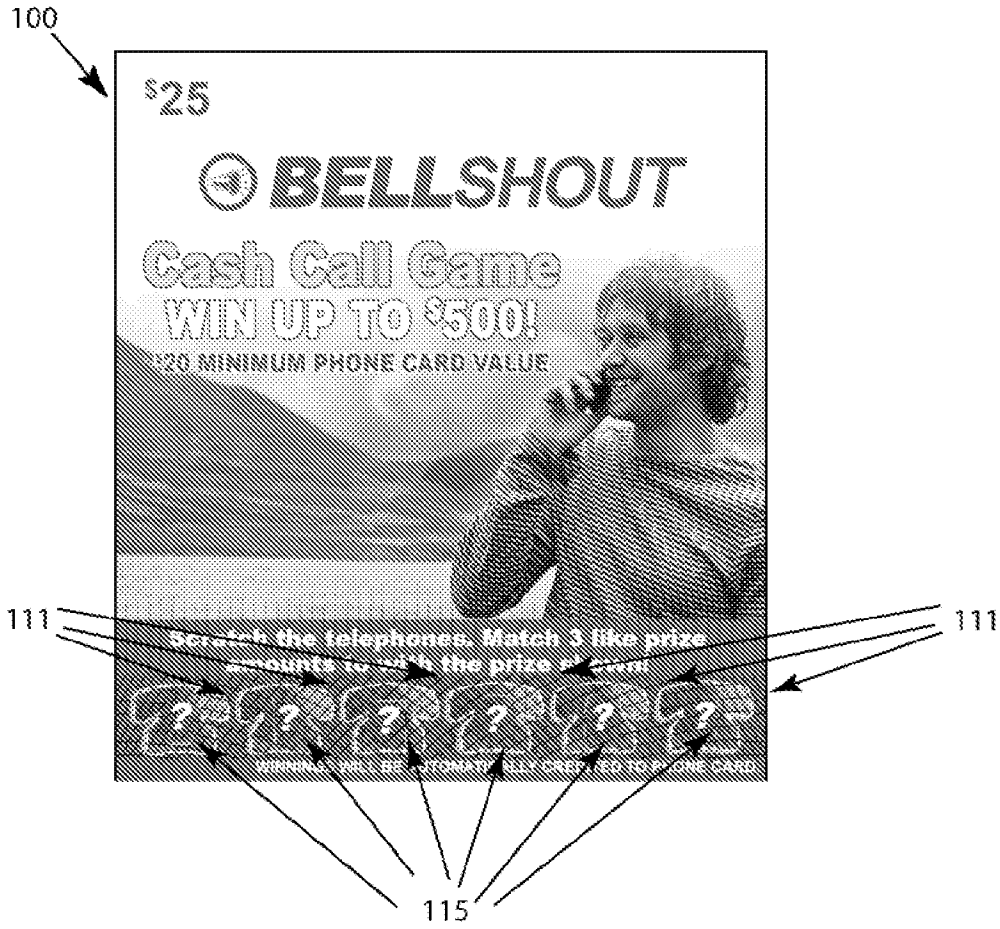
100
$25
BELLSHOUT
Cash Call Game
WIN UP TO $500!
$20 MINIMUM PHONE CARD VALUE
111
111
115

FIG. 3


100
101
$25
BELLSHOUT
Cash Call Game
WIN UP TO $500!
$20 MINIMUM PHONE CARD VALUE
Scratch the telephones. Match 3 like prize amounts to win the prize shown!
260

FIG. 4

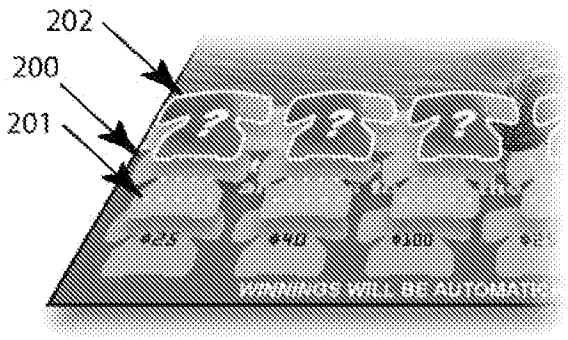
202
200
201

FIG. 5

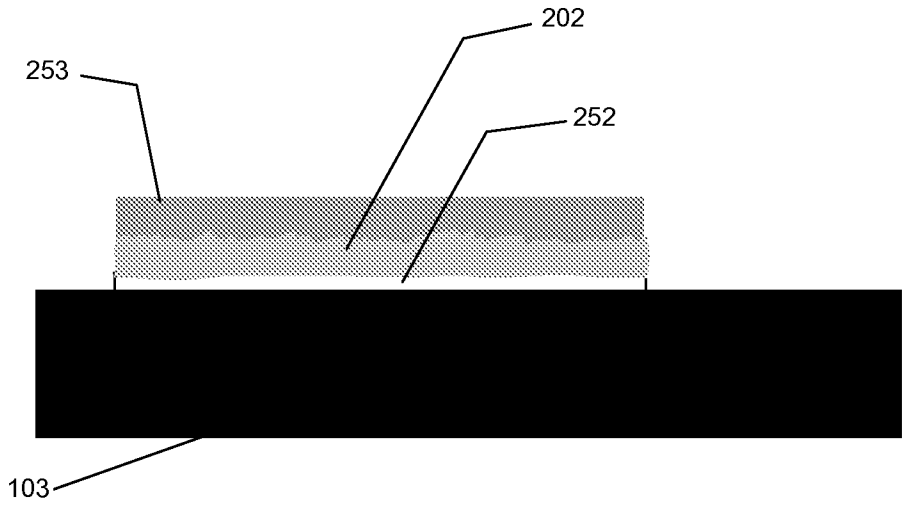

FIG. 6

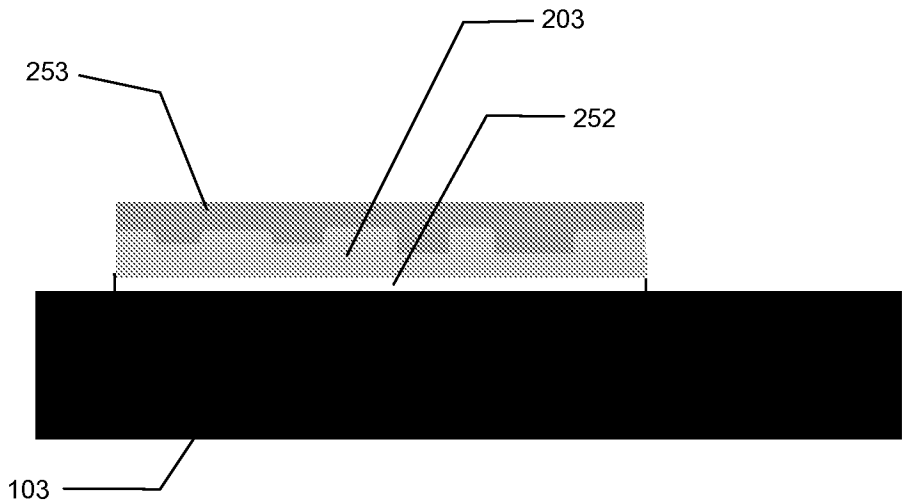

FIG. 7

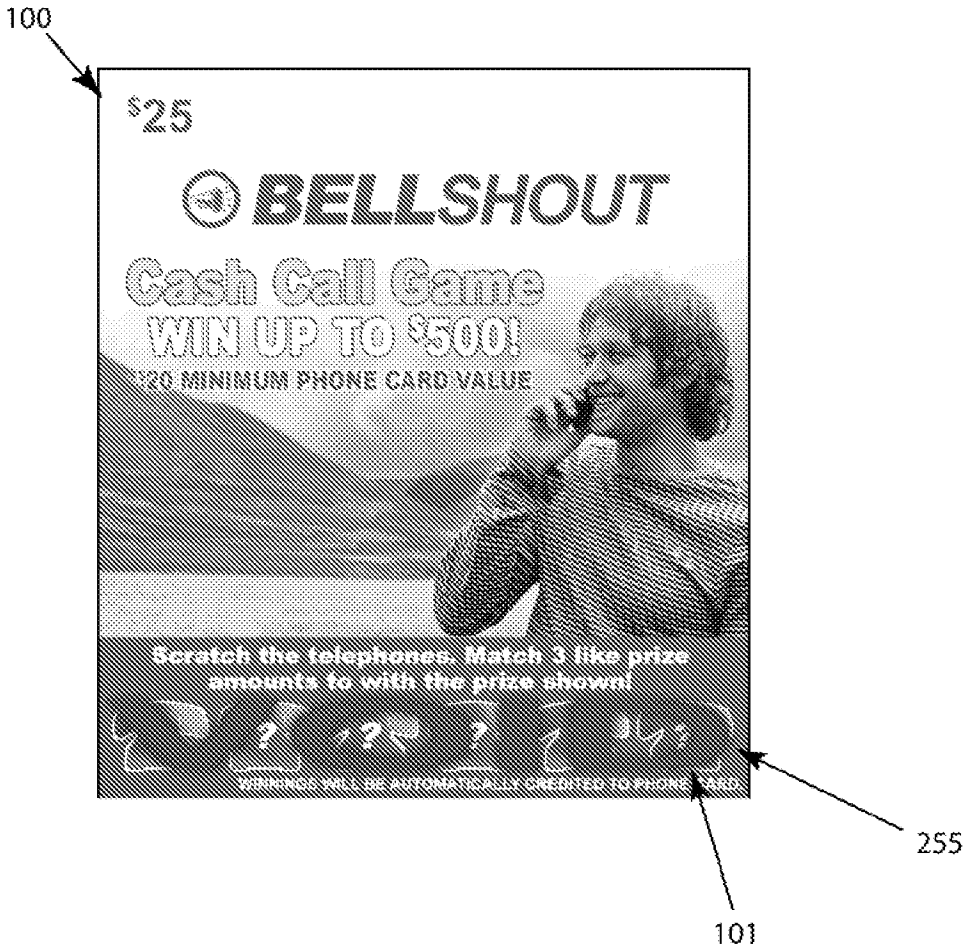
100
$25
BELLSHOUT
Cash Call Game
WIN UP TO $500!
$20 MINIMUM PHONE CARD VALUE
Scratch the telephones. Match 3 like prize amounts to win the prize shown!
255
101

FIG. 8

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2010/055514

A. CLASSIFICATION OF SUBJECT MATTER
INV. A63F3/06
ADD.

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)
A63F B42D

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 352 422 A (OBERTHUR GAMING TECH INC [CA]) 31 January 2001 (2001-01-31) page 4, line 16 - page 9, line 7; figures 1-3	1-8
A	US 5 667 250 A (BEHM WILLIAM F [US] ET AL) 16 September 1997 (1997-09-16) column 3, lines 3-65	1-8

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 March 2011	06/04/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Bagarry, Damien

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2010/055514

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2352422 A	31-01-2001	NONE	
US 5667250 A	16-09-1997	AU 661418 B2	20-07-1995
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