A laminated record card comprising internal layer of high tensile strands is described. This design aims to increase the strength of the card and form internal surfaces for reception of printed matter and magnetic read out coatings. The card is made from a body of material so formed as to provide security against unauthorized use and coding. High tensile strands distributed within an internal layer of the card limit punch hole recording to a particular computer program as well as to increase the strength of the card and form internal surfaces for reception of printed matter and magnetic read out coatings.

26 Claims, 3 Drawing Figures
LAMINATED RECORD CARD COMPRISING INTERNAL LAYER OF HIGH TENSILE STRANDS

This invention relates to the structure of a record medium such as relatively flexible cards, sheets, or webs on which different forms of intelligence may be recorded including visible printed matter, coded punch holes and magnetically readable coatings.

Cards bearing coded information as well as printed matter have been in wide use for some time in connection with negotiable instruments, certificates, currency, credit cards, billing forms and other such documents. Security against unauthorized or fraudulent use and alteration of such documents has been a problem to which the present invention is addressed.

The fabrication of flexible cards, sheets or webs from a laminate of layers including the distribution therein of high tensile strands to increase the strength of the laminate structure, is well known as disclosed for example in U.S. Pat. No. 1,291,709 to Angier et al. showing a sheet material product having spaced reinforcing elements between outer layers and a method of making the product. An important object of the present invention is to adapt such a laminate type structure in a unique manner for a relatively flexible card, in order to enhance security against unauthorized use and alteration of the coded information recorded on the card.

In accordance with the present invention, a record card on which information is recorded pursuant to a particular computer program, includes a body having outside layers made of translucent or light transmissive material adapted to receive printed matter thereon. At least one internal layer is sandwiched between the outside layers on which printed matter as well as magnetically sensed coatings are deposited. This internal layer is formed from high tensile and shear strength strands which are spaced apart by light transmissive filler material in order to maintain a constant thickness of the card. The strands are made of a material which resists shearing by the punch hole cutter normally utilized to form coded punch holes in record cards. Thus, the strands of the internal layer are distributed so that their width and spacing within a predetermined punch hole coding zone of the card does not interfere with the punching of holes. The distribution of the strands in the remaining portion of the card may also be varied and arranged to form internal surfaces at predetermined locations on the card on which magnetic coatings may be deposited for magnetic sensing purposes. Any attempt to utilize the card for unauthorized purposes may thereby be readily detected while unauthorized attempts to code punch the card would be thwarted by damage to the recording punch, elongation of a strand or formation of a readily detectable ragged hole upon rupture of the strand.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a front plan view of a typical record card constructed in accordance with the present invention.

FIG. 2 is an enlarged partial sectional view taken substantially through a plane indicated by section line 2—2 in FIG. 1.

FIG. 3 is a partial sectional view taken substantially through a plane indicated by section line 3—3 in FIG. 2 showing a portion of the internal layer of the record card.

Referring now to the drawings in detail, FIG. 1 illustrates a typical record medium in the form of a stock certificate card generally denoted by reference numeral 10. This card by way of example constitutes indicia of ownership of a predetermined number of shares issued by a corporate organization. The card not only bears printed information but also coded information associated with a computer program by means of which stock transfer transactions are facilitated. Thus, the stock certificate 10 is a printed and coded product of a computerized stock transfer system. It should of course be appreciated that the principles underlying the construction of the stock certificate 10 are applicable to other documents bearing detectable intelligence such as printed and coded information as hereinbefore indicated.

In the illustrated embodiment, the stock certificate 10 is in the form of a relatively flexible card similar in appearance to paper cards presently utilized for example in connection with billing of customers through computerized accounting systems. Thus, the card or stock certificate 10 in accordance with the present invention bears both printed information as well as coded information in the form of punch holes 12. As more clearly seen in FIG. 2, the body of the stock certificate card is made from a laminate of bonded or fused layers including outside layers 14 and 16 forming a protective front and rear face surface. These outside layers are made of a translucent or light transmissive material such as plastic or other equivalent compositions. The outside layers are bonded or fused to at least one internal layer 18. The outer surfaces of the outside layers 14 and 16 may receive printed matter such as indicated by reference numeral 20 on the front face illustrated in FIG. 1. Printed matter such as indicated by reference numeral 22 in FIG. 1 may also be applied to the interface between the outside and internal layers in order to form a border design or corporate seal for example analogous to watermarks on writing paper. It will of course be appreciated that the printed matter on both interface surfaces and external surfaces of the card may be located in accordance with any desired requirements and will ordinarily be arranged to make it easy to recognize counterfeit reproductions of the card. It should be understood of course that the printed matter is formed by any type of printing method including engraving as well as photo-offset methods so as to comply with any requirements associated with particular types of documents.

The internal layer 18 includes a plurality of spaced strands of different widths such as relatively narrow strands 24 and relatively wider strands 26 as shown in FIGS. 2 and 3. The strands may be bonded to each other by a filler material 28 such as epoxy cement or embedded within the body of the card. The filler material is also utilized to form a flush interface between the outside and internal layers so that the card will be substantially uniform in thickness throughout. Furthermore, the filler material 28 is light transmissive as compared to the strands 24 and 26 which are opaque. The strands being opaque will therefore give the stock certificate card 10 an almost opaque appearance. Also, the strands may be of different colors for color coding purposes to be either seen visually or by optical scanning devices. Furthermore, any printed matter on the interface between the internal layer 18 and the outside layers will be restricted to the opposite interface surfaces of the strands so that the printed matter on each interface will be visible from a corresponding side of the card only.

The strands 24 and 26 are made of a material having a substantially higher tensile and shear strength than the material from which the outside layers and filler are made. Thus, the strands increase the strength and durability of the card. More importantly however, the material property of the strands is such that to effectively resist or prevent any clean-cut removal of holes through the card at any location occupied by a strand. Therefore, the punch holes 12 are necessarily located between strands in accordance with the present invention as shown in FIG. 2. The usual punch tool associated with a punch hole recording machine such as disclosed in U.S. Pat. No. 2,647,581 to Gardinier et al. may be set to punch holes at desired locations on the card so as to rupture or shear the outside layers and filler and form a clean-cut punch hole 12. Of course, one familiar with the coded strand distribution pattern may set the punch positions to avoid the strands. Should the punch attempt be made to form a hole at a location traversed by a strand, the strand if ruptured will have ragged edges and rip the card so that any aperture or hole so formed will be readily distinguishable from the clean-cut punch holes 12. Improperly punched holes will also be rejected by any punch hole reading device.
In accordance with the objectives of the present invention as hereinbefore indicated, an appropriate selection of material is made for the strands. Materials such as metal foil, nylon, fiber glass, etc. may be utilized. Furthermore, the strands are distributed within the internal layer 18 in a non-uniform manner so as to form a unique pattern for each customer designed to meet each customer's requirements. For example, in the illustrated embodiment, punch hole recording is confined to a zone disposed on one side of the line 30 as shown. Accordingly, the strands 24 are less densely distributed or more widely spaced than the strands in the remaining portion of the card as shown in FIG. 3 in order to accommodate the formation of punch holes 12 between the strands within the punch recording zone. Thus, the card 10 will be suitable only for a particular computer program by virtue of the location of the punch holes. The color coding of the strands aforementioned further endows the card with uniqueness.

The strand distribution pattern for the cards may also be designed to accommodate the deposit of magnetic ink coatings 32 such as indicated in FIG. 3 at predetermined locations on either side of one or more of the strands. These magnetic ink coatings are preferably invisible so that they may only be detected by magnetic sensing devices. In this manner, the authenticity of any card may be determined by a suitable magnetic sensing type of validity checking operation. Magnetic printing 34 which is both visible and magnetically sensed as shown in FIG. 1 may also be applied to each card on either or both sides, and either on the outside surfaces or the interface surfaces so that each card will be characterized by a different number or symbol.

It will be appreciated from the foregoing description, that the novel structure of the record medium or card 10 is useful with known security checking techniques to provide each customer with a structurally unique record medium having increased security against unauthorized and fraudulent use and alteration.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A security record including a laminate structure formed from a pair of outside layers and at least one internal layer, said outside layers being uniformly light transmissive, said internal layer including a plurality of spaced strands separated by light transmissive filler material, said strands being made of material having a substantially higher tensile and shear strength than the outside layers and the filler material, said strands being distributed in the internal layer in a non-uniform pattern arrangement, and detectable intelligence formed at least in said internal layer.
2. The combination of claim 1 wherein said strands are opaque.
3. The combination of claim 2 wherein said detectable intelligence includes punch holes extending through the layers only between the strands of the internal layer.
4. The combination of claim 3 wherein said detectable intelligence further includes printed matter on the outside layers and on the strands of the internal layer visible through at least one of the outside layers.
5. The combination of claim 4 wherein the printed matter on the internal layer includes areas coated by magnetic ink.
6. The combination of claim 5 wherein the laminate structure includes a zone within which all punch holes are confined, the strands of the internal layer being less densely distributed within said zone.
7. The combination of claim 1 wherein said detectable intelligence includes punch holes extending through the layers only between the strands of the internal layer.
8. The combination of claim 7 wherein the laminate structure includes a zone within which all punch holes are confined, the strands of the internal layer being less densely distributed within said zone.
9. The combination of claim 1 wherein said detectable intelligence further includes printed matter on the outside layers and on the strands of the internal layer visible through at least one of the outside layers.
10. The combination of claim 9 wherein the printed matter on the internal layer includes areas coated by magnetic ink.
11. The combination of claim 1 wherein the laminate structure includes a recording zone within which the strands of the internal layer are less densely distributed.
12. The combination of claim 11 wherein said detectable intelligence includes printed matter on the strands of the internal layer.
13. The combination of claim 12 wherein said printed matter is formed by areas coated by magnetic ink.
14. The combination of claim 13 wherein said detectable intelligence includes printed matter on the strands of the internal layer.
15. The combination of claim 14 wherein said printed matter is formed by areas coated by magnetic ink.
16. A security record including a laminate body formed from a pair of outside layers and at least one internal layer, said outside layers being light transmissive, said internal layer including a plurality of spaced strands separated by light transmissive filler material, said strands being made of material having a substantially higher tensile and shear strength than the outside layers and the filler material, said strands being distributed in the internal layer in a non-uniform pattern arrangement, and detectable intelligence formed at least in said internal layer.
17. The combination of claim 16 including printed matter on the strands of the internal layer.
18. The combination of claim 17 wherein the strands vary in width.
19. The combination of claim 18 wherein the strands vary in width.
20. The combination of claim 16 wherein punch holes extend through the layers only between the strands in the recording zone of the internal layer.
21. A security record including a body made of light transmissive material, a plurality of spaced strands embedded in said body having a substantially higher tensile and shear strength, said strands being less densely distributed within a predetermined recording zone of the body, said recording zone having punch holes extending therethrough only between the strands.
22. The combination of claim 21 including ink deposited on the strands internally of the body.
23. The combination of claim 22 including ink deposited externally on the body.
24. The combination of claim 23 wherein the strands vary in width and form a coded pattern within the body.
25. The combination of claim 21 wherein the strands vary in width and form a coded pattern within the body.
26. The combination of claim 21 including ink deposited externally on the body.
* * * * *