United States Patent

Ban

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[54] COLORED RECORDING DISCS

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[52] **U.S. Cl.** ..... **274/42 P**
[51] **Int. Cl.** **G11b 3/84**
[58] **Field of Search** ..... 274/42 R, 42 P

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[57] **ABSTRACT**

A colored recording disc comprising a transparent plastic sheet having recording grooves on the front face and color printing applied directly or indirectly to the rear face of said plastic sheet, so that the printing which may include a picture, photograph, design or the name of subject, the name of sponser and other necessary matters can be seen through the transparent plastic sheet.

1 Claim, 9 Drawing Figures

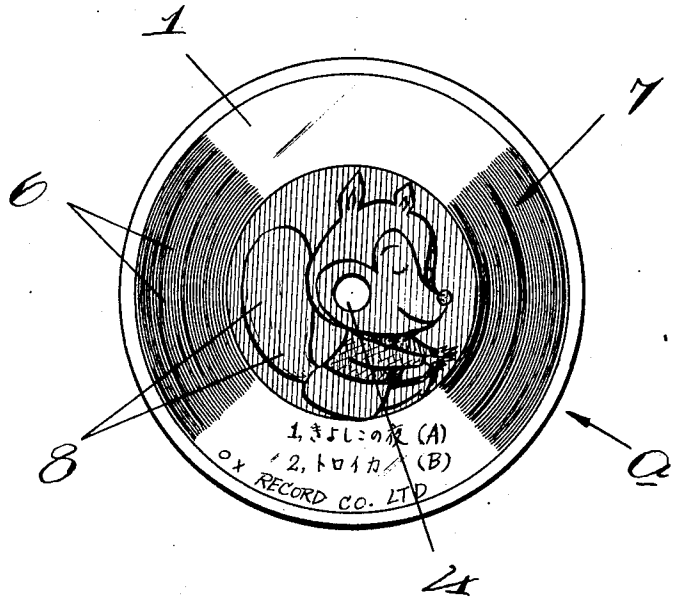


FIG. 1

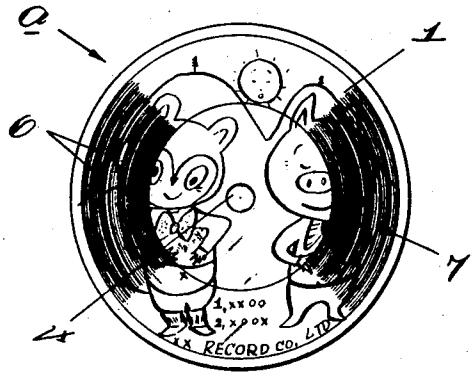


FIG. 3

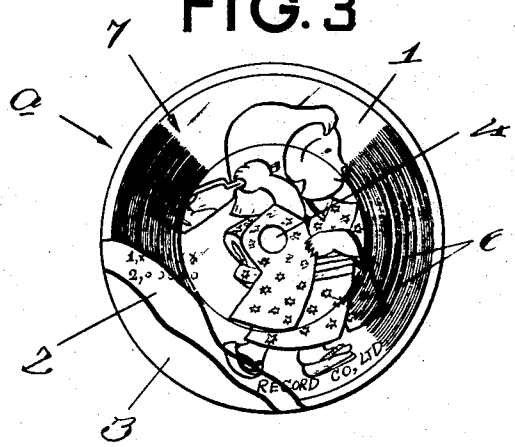


FIG. 2

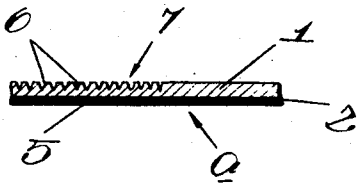


FIG. 4

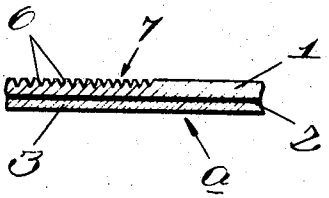


FIG. 5

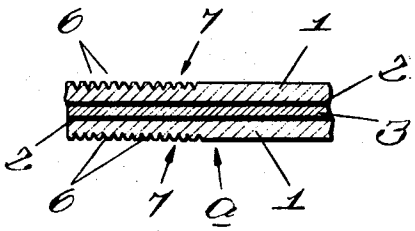
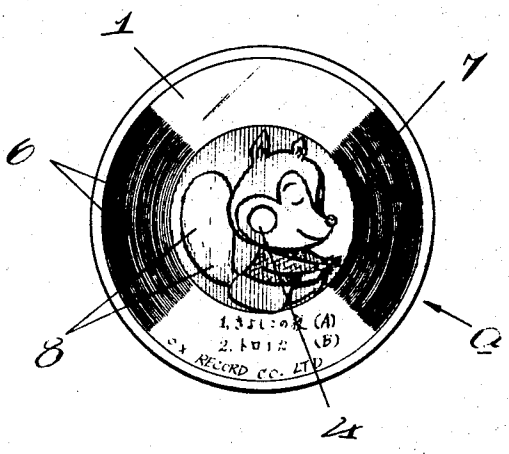


FIG. 6



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FIG. 7A

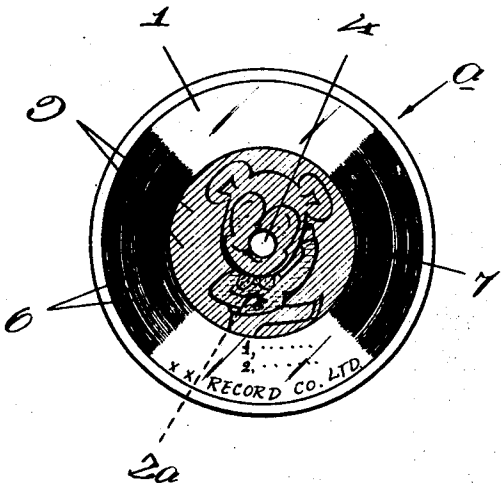


FIG. 7B

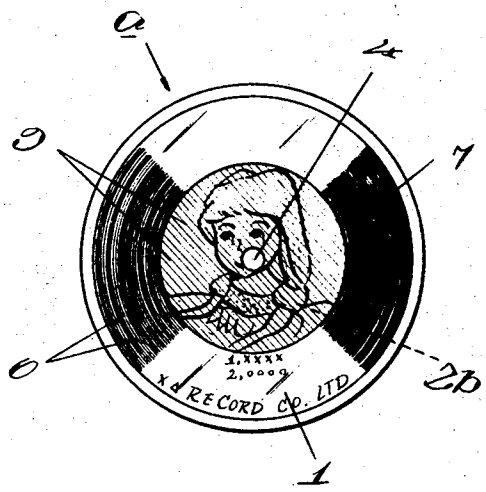
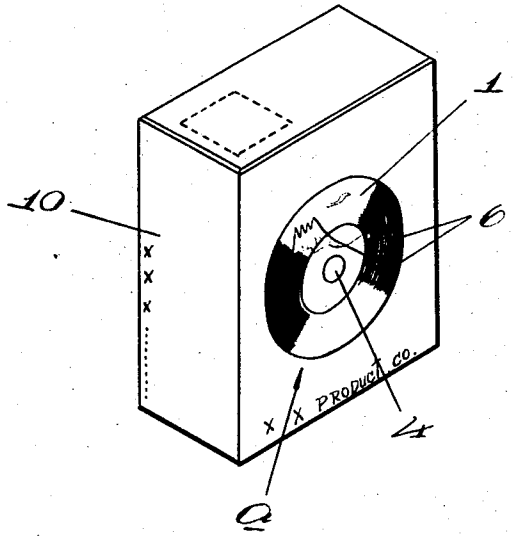


FIG. 8



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COLORED RECORDING DISCS

The present invention relates to colored recording discs.

The object of the present invention is to supply colored recording discs that can be provided with beautiful patterns like pictures, photographs, or patterns and the like.

Another object of the present invention is to supply colored recording discs in which a color picture can be seen through a synthetic resin sheet provided on its front face with sound recording grooves.

Another object of the present invention is to supply a thin sheet-like recording disc or to manufacture and supply comparatively inflexible sheet-like recording discs as desired.

Still another object of the present invention is to supply colored recording discs which are provided with stereo printing locally on the central portion not including the recording portion so as to improve their appearance.

A further object of the present invention is to supply colored recording which have two different printed patterns which will appear at standstill condition by applying specific printing to the central portion about the record hole, and not including the recording portions of the disc.

In addition, it is also an object of the present invention to supply colored recording discs which have a single recording face or double recording faces and those can be obtained by making the disc as a single layer or multiple layer structure as desired.

In consideration of the above-said objects and other objects that may be described hereinafter, some embodiments of the present invention will be described hereinbelow.

In the accompanying drawings,

FIG. 1 is a plan view of a single layer structure of a colored recording disc according to the present invention;

FIG. 2 is an enlarged section of a portion thereof;

FIG. 3 is a plan view of a colored recording discs in layered structure with parts of the structure broken away;

FIG. 4 is an enlarged section of a portion of FIG. 3;

FIG. 5 an enlarged section of a portion showing another embodiment of a layered structure;

FIG. 6 is a plan view provided with printing only in the central portion of the non-recording part of the colored recording disc;

FIG. 7A and 7B show the plan view of an embodiment given with specific printing changing patterns to two forms when view angle is changed to the central portion of non-recording part of the colored recording disc, and

FIG. 8 shows a perspective view of an embodiment which comprises a colored recording disc forming part of a container.

In the accompanying drawings, numeral 1 indicates a plastic sheet which is transparent and provided with a sound groove for recording sound. Sheet 1 may be made from chloride, polyethylene, polycarbonate. Numeral 2 indicates printed patterns seen through said transparent plastic sheet including pictures, photographs, geometrical patterns of all shapes and colors that are possible of printing. Numeral 3 indicates a base plate for printing of a sheet form such a base plate and

is interposed between two sheets when is a layered structural body, and its is consisted of a non-transparent body. Numeral 4 indicates the shaft hole of the recording disc *a*. Various embodiments of the present invention will now be described in further detail with reference to the accompanying drawings.

The record disc shown in FIG. 1 and FIG. 2 is a single layer structure wherein printed pattern portion 2 is applied in reversed manner to the rear surface of the plastic sheet 1 made of transparent synthetic resin so that the printed pattern can be observed through the front face of sheet 1.

It is also possible to apply subsequently a milky white coloring to said printed rear face whereby a white color surface 5 is formed and thereby the transparent condition is made opaque

The sheet provided with the printed pattern 2 can be made into a recording plate with record grooves heating the sheet and pressing the desired sound grooves thereinto from an original sound plate.

The embodiments shown in FIG. 1 and FIG. 2 has record surface 7 on only one of the record plate a, but by having two sheets of the record plate a of a structure as shown in FIG. 1 and FIG. 2 opposedly placed against each other and adhered by welding or an adhesive agent, two record surfaces 7 can be formed.

The record plate shown in FIG. 3 and FIG. 4 has a layered structure of double layers, in which a printed pattern portion 2 are formed by print on one surface of a base plate 3, and in which a transparent plastic sheet 1 is placed upon and integrally connected to said print pattern and whereafter record sound grooves 6 are formed in the sheet as described above.

In the case when the thickness of the base plate 3 for printing is significantly thin in comparison with the plastic sheet 1, as shown in FIG. 3 and FIG. 4, record surfaces 7 may be formed on both surfaces.

FIG. 5 shows such an embodiment in which different printed pattern portions 2 are applied to the front surface and back surface of the base plate 3, and at the same time the transparent plastic sheets 1 are adhered or heatingly welded to the respective front face of said printing pattern portions 2 whereby a layered structural body is obtained.

In the embodiment in FIG. 6 the central portion with the shaft hole 4 of a record plate is provided with local stereo printing 2*a* in the non-recording portion, i.e. a portion of the plastic sheet 1 is provided with the stereo printing 2*a* comprising alternatingly recessed and projected lines 8 thereby giving a lens effect thereto, and to thereby impart a stereo feeling or three-dimensional impression to it.

In the embodiments shown in FIG. 7A and FIG. 7B, there are provided in the non-record portion, that is, in the circular portion with the shaft hole 4 as the center, specific recessed and projected lines 9 to form triangular grooves on the side faces of which respectively different patterns, pictures, and the like being drawn so that by varying the viewing angle of the recessed and projected lines 9 it is possible to see printed patterns 2*a*, 2*b* of two different two kinds as shown respectively in FIG. 7A and 7B, so that rotating of the record plate a and thereby changing the viewing angle it has effect that the printed patterns 2*a*, 2*b* of two kinds can be seen alternatingly at standstill condition.

The embodiment shown in FIG. 8 illustrates a record plate a provided with various structures as described above forms a portion of a container **10**, and after using the container the portions thereof surrounding the record plate may be broken off and only the record plate a retained.

Since the record plate a according to the present invention has transparent plastic sheet **1** of vynil chloride, polyethylene, polycarbonate, and the like the front face of which is provided with a recording groove, and since on the rear face thereof the printing pattern portion **2** is provided by printing directly or indirectly through the base plate **3** which printing pattern portion **2** can be seen through the plastic sheet **1**, the various colors of the picture, photograph, drawn in the printing pattern portion **2** do not come into contact with the atmosphere, color fading or damage of the printing pattern is prevented and in consequence its beauty is maintained for a long time.

Also, in the non-recording portion that is shown in FIG. **6**, FIG. **7A** and FIG. **7B**, the printing pattern portion **2** can be made into stereo-printing, so that it is possible to obtain a beautiful and a variable record plate a by varying the position of the angle of view.

Especially, when specific print patterns are imparted as shown FIG. **7A** and FIG. **7B**, the two printed patterns **2*a***, **2*b*** will appear intermittently at each time as the position of the recessed and projected lines **9** of the plastic sheet **1** changes with respect to a viewer by rotating of record plate a, whereby a strobe effect together with the effect of change of the sight, will result that the printed patterns **2*a***, **2*b*** will be observed alternatingly at standstill condition.

The recording disc of the present invention is simple in its construction, its manufacture is simple and quantity production is high, and it has also the additional advantage of superiority in recording characteristic.

Various embodiments have been described heretofore relative to the present invention, but the present invention is not restricted to said embodiments, and it of course can be changed in any way within the technical scope of the present invention.

What is desired to be protected by Letters of Patent for the present invention is:

1. A recording disc comprising a single circular transparent sheet provided on an outer annular portion of one face thereof with circular sound grooves so as to leave a central portion on said one face free of sound grooves, and at the opposite face thereof with a printing covering an area corresponding to said central portion of said one face, said printing being applied in reverse so as to be visible in correct form from said one face through said transparent plastic material and said printing including a pair of stereo-optic photographs, said central portion of said one face being provided with closely arranged parallel grooves and ridges, providing a three dimensional effect on said printing on said face when viewed from said one face; and an opaque film of paint applied over said printing on said other face.

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