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L. D. NORTON

2,043,769

RECORD TABLET

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Fig. 1.

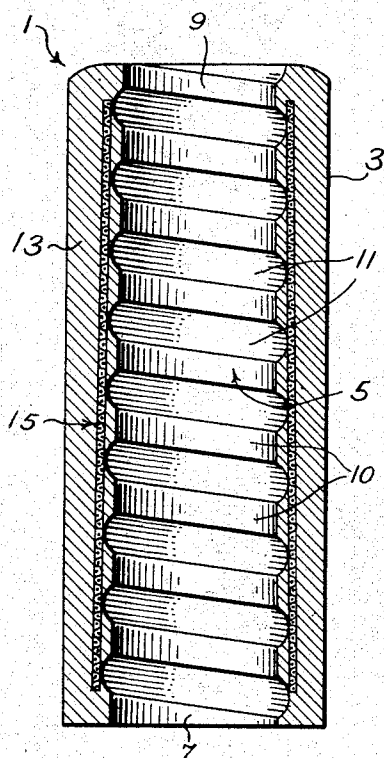


Fig. 2.

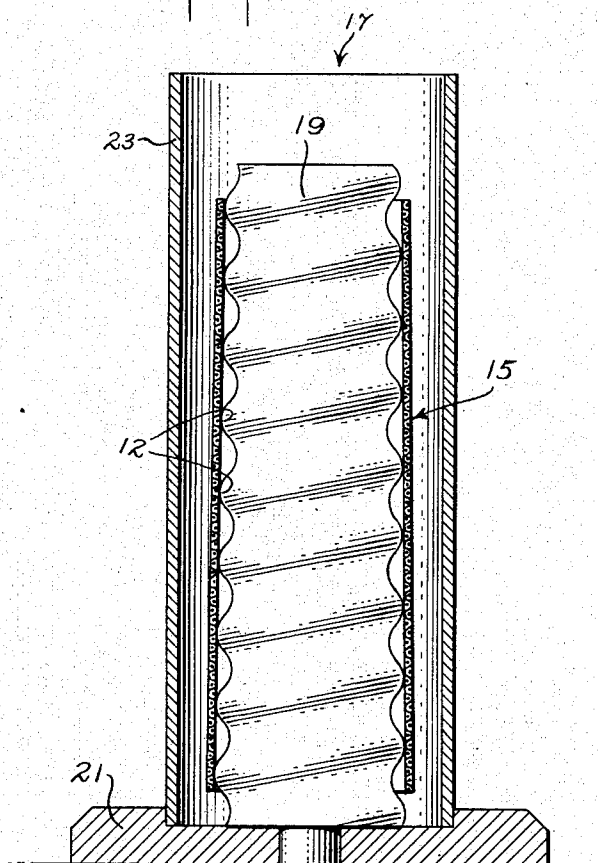


Fig. 3.

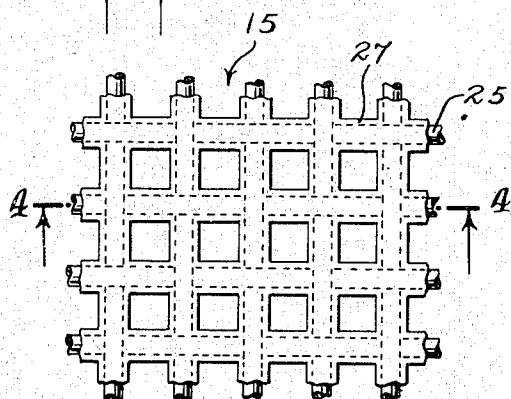
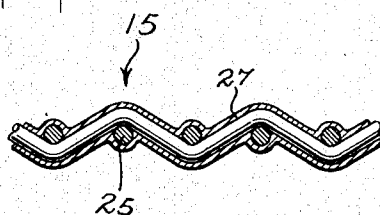


Fig. 4.



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RECORD TABLET

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4 Claims. (Cl. 274-44)

This invention relates to sound record tablets and with regard to certain more specific features to reinforced sound record tablets.

One of the objects of the invention is to provide an inexpensive reinforcing medium for a sound record tablet, said medium being substantially unaffected by ordinary temperatures at which wax melts, and being adapted to adhere to the wax of the tablet in a satisfactory manner.

Another object of the invention is to provide a more durable record tablet, and to provide a more efficient reinforcing lining for the tablet.

Other objects will be in part obvious and in part pointed out hereinafter.

This invention accordingly consists in the features of construction, combination of elements, and arrangements of parts which will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawing, in which is shown one of the various possible embodiments of the invention,

Figure 1 is a vertical axial section of a cylindrical sound record tablet which embodies the invention;

Figure 2 is a vertical axial section of a mold used in making the sound record tablet of Figure 1, and shows a reinforcement embodying the invention positioned on the core of the mold;

Figure 3 is a fragmentary detail plan view of the reinforcing medium of Figure 2; and,

Figure 4 is a vertical section taken on line 4-4 of Figure 3.

Corresponding reference characters indicate corresponding parts throughout the several views of the drawing.

Referring now more particularly to Figure 1, there is shown at numeral 1 a sound record tablet in the form of a hollow cylinder, upon the outer surface 3 of which a sound record is adapted to be recorded by a suitable recording stylus, the sound record thus made being capable of later reproduction by a suitable reproducing stylus. During the above operations the sound record tablet is usually supported upon a mandrel having resilient means, comprising friction devices, for firmly engaging the inner surface of the sound record tablet, and holding it against rotational movement or longitudinal movement relative to the mandrel. The mandrel upon which the record tablet is placed is tapered and consequently the internal surface 5 of the record is also tapered.

Numerals 7 and 9 indicate the larger and

smaller ends of the taper respectively. The taper is provided among other reasons, to enable the tablet to be easily withdrawn from the core when being made and to allow the tablet to be easily applied to and removed from the mandrel. In order to improve the grip of the mandrel upon the tablet, the inside surface 5 is fluted with helical ribs 10 and grooves 11.

The cylinder 1 during the recording and reproducing operations, and even when not positioned on a mandrel is subject to various stresses and strains caused by temperature changes and by the friction devices on the mandrel. Stresses and strains may result also from dropping the record or from hitting it against a solid object. For these and other reasons it has been customary to embody in the wax-like material 13 from which the record tablets 1 are made, a reinforcing medium 15, which tends to prevent the stresses and strains from cracking the cylinder. It is advantageous to have a reinforcing medium 15 to which the wax-like material 13 effectively adheres because, in the event of a blow which is great enough to shatter or crack the record, notwithstanding the reinforcing lining 15, the reinforcing medium should be able to hold the pieces of shattered wax-like material in close contact with each other in the position which they were prior to the shattering or cracking. Rubber reinforcing linings 15 have been used for this purpose and are effective in holding the pieces of the shattered record together, because the congealed wax-like material tends to adhere to the rubber lining. However, in some instances the rubber lining is not entirely satisfactory, because the heat of the molten wax-like material softens the lining, which is then able to move into the hollows of the helix 12 of the core 19, and so is positioned in the ribs 10 of the molded record cylinder. The presence of rubber lining in the ribs 10 may interfere later with the reaming of the cylinder, by gumming up the reamer.

A record cylinder such as is shown in Figure 1 may be produced in manufacture from a mold 17, as shown in Figure 2. The ribs 10 and grooves 11 are produced by a core 19 having a helical surface which core is mounted on a base 21 of the mold 17, the base also holding a shell 23 concentrically of the core 19. In the manufacture of the record, the molten wax-like material 13 is poured into the shell through the opening at the top of the shell 23. After the waxy material 13 has cooled off sufficiently to congeal, the shell 23 is removed from the record tablet by any suitable means, and the core 19 is removed by screwing it

out of the record. Thus in this way the ribs 10 and grooves 11 act as a thread to facilitate the withdrawal of the core from the record.

Prior to the pouring of the wax-like material 13 into the shell 23 the reinforcing medium 15 is positioned over the core 19. The reinforcing medium essentially comprises a tapered tubular lining, and is made to just touch the crests 12 of the helix formed upon the core. It is decidedly advantageous that the helix be preserved in the finished cylinder, and hence it is desirable that the lining 15 be sufficiently porous or open-meshed to allow the molten material 13 to flow through from the outside of the lining as it is poured into the shell 23 to the surface of the core 19, whereby the lining 15 is substantially entirely embedded within the waxy cylinder thus formed.

As above pointed out, it is desirable that the wax-like material 13 and the reinforcing lining 15 adhere to each other; and it is further desirable that the lining 15 be slightly elastic, or if it be inelastic, that the bond between the lining 15 and the wax-like material 13 be slightly elastic, in order that the differences in the expansions of the wax-like material 13 and the lining 15 due to changes in temperature may be compensated. It has been customary to use a relatively non-elastic material such as crinoline as a reinforcing medium 15. The crinoline is not affected by the heat of the molten wax-like material 13 and so does not move into the grooves of the core helix when the material 13 is in a molten condition. However, the use of crinoline alone is not entirely satisfactory because the wax-like material does not adhere to the crinoline after congealing and in the event of shattering of the record the individual pieces of the wax-like material may fall away from the reinforcing medium 15. Further, the helices formed on the interior of a record cylinder, because of the intervening layer of reinforcing material, are not very securely united with the waxy material forming the body of the cylinder, so that unless there is effective adhesion between the wax and the lining, the threads of the helix are apt to be broken or chipped off by contact with the ends of the mandrels upon which the cylinder is used. As a result the cylinder is unevenly supported when seated upon a mandrel for use in recording or reproducing. Thus the cylinder is subjected to uneven stresses and strains, and is likely to become cracked or the recording or reproduction to be distorted. Furthermore, the crinoline, being substantially inelastic, may of itself cause cracking of the wax material 13 when the cylinder is subjected to temperature changes, because of the different coefficients of expansion of the wax-like material and the crinoline.

In the present invention I have provided an improved reinforcing lining 15 which overcomes all of the above-mentioned difficulties. My lining comprises the usual open-meshed fabric 25, such as crinoline, or the like; but I treat the fabric 25 with a binder 27 (see Figures 3 and 4) which accomplishes the desired results. I have found that a binder 27 which adheres to the crinoline 25, and also to the wax-like material, and which of itself possesses some elasticity is satisfactory. The binder 27, which I propose to use also should be of such a nature that it may be applied to the crinoline 25 without filling up the interstices of the crinoline; otherwise, the molten wax-like material 13 could not flow through the

lining 15 to the surface of the core 19 as above described.

I have found that a material such as, for example, latex rubber (coagulated latex) fulfills the requirements of a satisfactory binder 27; and that a crinoline lining 25, coated with latex rubber, sticks to or adheres to the congealed wax-like material 13 and vice versa. Further, the latex rubber is sufficiently pliable and elastic to compensate for the differences in the expansions of the two materials (the crinoline and the material 13) with temperature changes.

The manufacture of a cylindrical sound record employing my invention may be carried out as follows:

A sheet of the open-meshed fabric 25 is first treated with a solution of latex rubber or the like, before it is formed into a tube. Care is taken to use a thin solution, to prevent the latex rubber from filling in the interstices of the open-meshed fabric. The solvent of the solution is then evaporated, and the individual threads of the crinoline are left coated with a film of latex rubber. The crinoline sheet is now cut to the proper sizes and permanently formed into tubes by juxtaposing edges of the sheets, and pressing them together. The edges are held in this position by the adhesive properties of the binding agent 27. In this way the reinforcing tubes or linings 15 are formed without additional fastening means such as thread, rivets, or the like.

A crinoline tube 15 with the individual threads coated with rubber latex is now positioned on the core 19 and the molten waxy material 13 poured into the shell 23. The wax flows through the interstices of the lining 15 which have not been closed by the latex rubber 27. As hereinbefore pointed out, the crinoline 25 is not affected by the heat of the molten wax 13 and does not stretch into the hollows of the core helix, but retains its shape throughout the pouring of the wax 13. The molten wax coming into contact with the binding agent 27 on the individual threads of the crinoline adheres to the agent 27 after congealing. In the event of shattering of the record the shattered pieces of wax are held in close contact with each other because of the lining 15 and the binding material 27.

Although I am not aware of the exact physical and/or chemical action which takes place between the molten and/or congealed wax-like material 13 and the latex rubber 27, I am aware that the congealed wax-like material does adhere firmly to the latex rubber. Other binding agents may be used to accomplish this binding between the crinoline 25 and the wax-like material 13, and accordingly I do not wish to limit my invention to the use of latex rubber.

A record manufactured in accordance with my invention will not fall to pieces when subjected to a shattering, but will maintain its original shape, the pieces of the wax-like material being held together firmly by the crinoline, so that reproduction of the record is possible even though the cylinder be broken. Moreover, pieces of wax-like material which are chipped from the interior of the cylinder by the ordinary wear and tear of putting a cylinder on and taking it off a mandrel, are retained in position by the adhesive and elastic action of the binder 27.

As various embodiments might be made of this invention, and as various changes might be made in the construction herein described, all without departing from the scope of the invention, 75

it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

5 I claim:

10 1. A sound record tablet having a sound recording surface and a mandrel contacting surface, reinforcing means embedded in said sound record tablet between said surfaces, said means comprising open-meshed relatively non-elastic fabric, and unvulcanized elastic rubber covering the strands without filling the meshes of said open-meshed fabric.

15 2. A sound record tablet having a sound recording surface and a supporting surface, reinforcing means embedded between said surfaces, said means comprising an open-meshed relatively inelastic fabric, and elastic means separating

said fabric from the material of said record, said means comprising a coating of latex rubber surrounding the fibres without filling the meshes of said fabric.

3. A sound record tablet having a sound recording surface and a supporting surface, a reinforcing means embedded between said surfaces, said means comprising an open-meshed, unvulcanized rubber treated relatively inelastic fibre fabric. 5 10

4. A sound record tablet having a sound recording surface, a supporting surface, and a reinforcing means embedded between the said surfaces, said means comprising a perforate unvulcanized rubber treated relatively inelastic material. 15

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