

Sept. 15, 1942.

R. S. DECH

2,295,938

METHOD OF MAKING PHONOGRAPH DISKS

Original Filed June 24, 1941

2 Sheets-Sheet 1

Fig. 1.

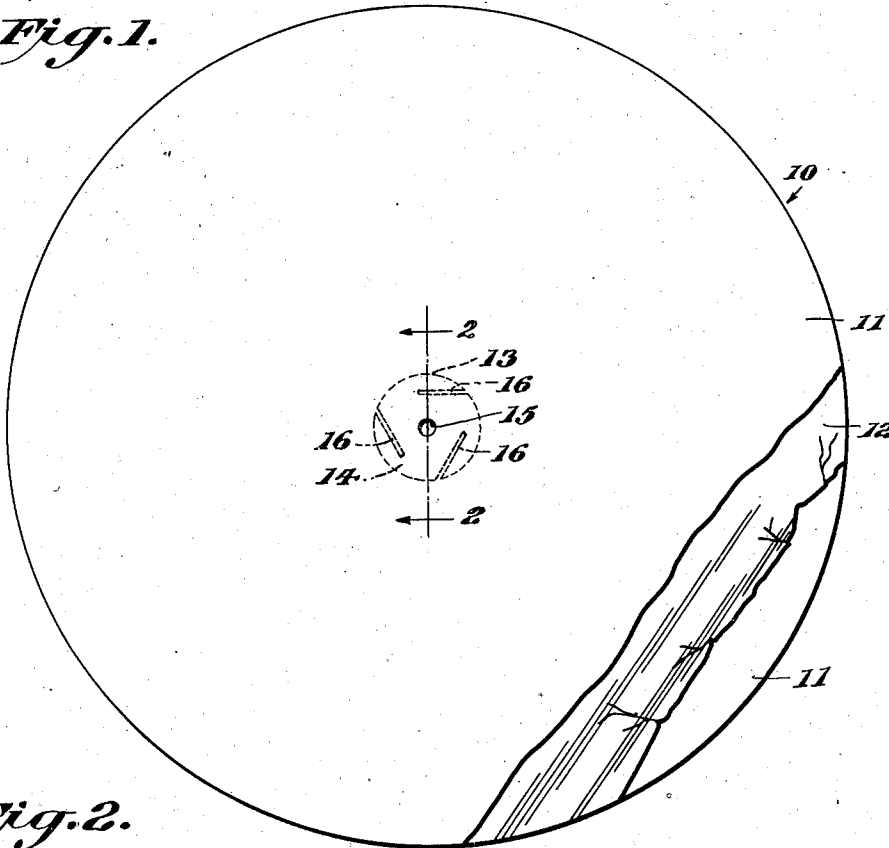


Fig. 2.

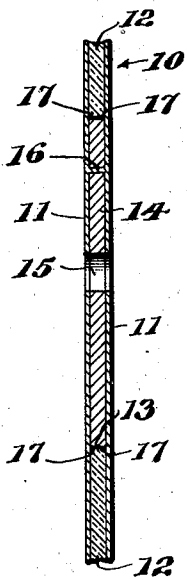


Fig. 7.

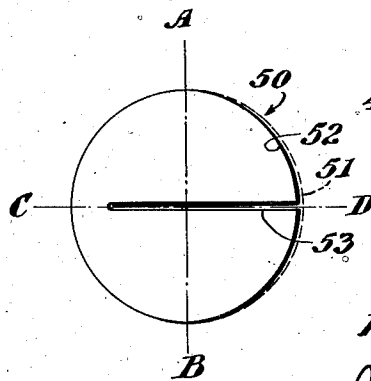
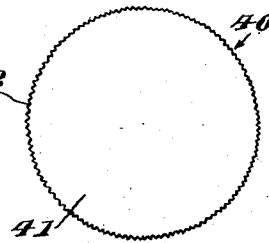


Fig. 5.



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Fig. 3.

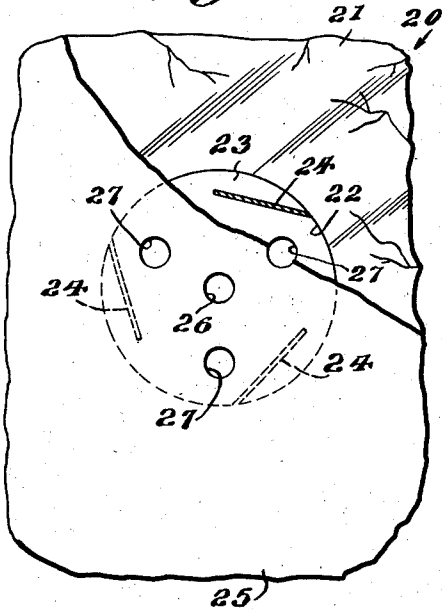


Fig. 4.

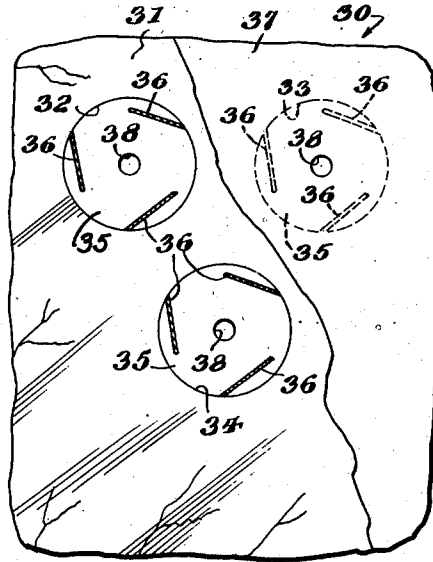


Fig. 8.

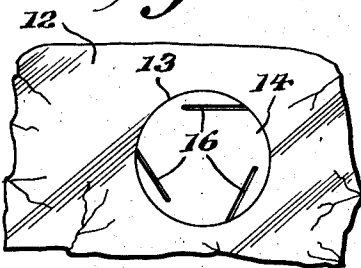


Fig. 9.

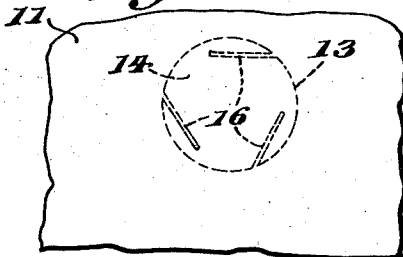
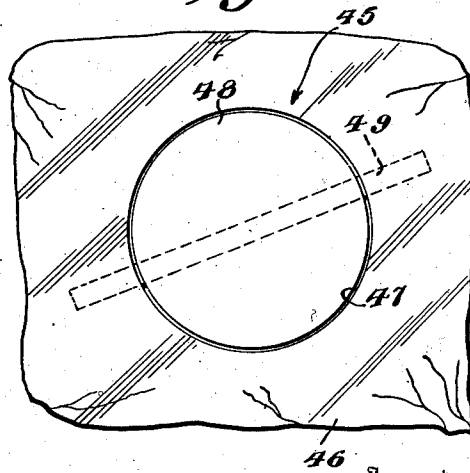


Fig. 6.



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2,295,938

METHOD OF MAKING PHONOGRAPH DISKS

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Original application June 24, 1941, Serial No.
399,501, now Patent No. 2,283,797, dated May
19, 1942. Divided and this application March
24, 1942, Serial No. 436,026

10 Claims. (Cl. 274-46)

This invention relates to new and useful improvements in methods of making phonograph disks and has particular relation to an improved method of making sound record blanks.

The objects and advantages of the invention will be apparent from a consideration of the following detailed description taken in connection with the accompanying drawings. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

The present application is a division of my application Serial Number 399,501, filed June 24, 1941, now Patent Number 2,283,797 of May 19, 1942.

In the drawings:

Fig. 1 is a face view of a phonograph disk made in accordance with the method of the invention;

Fig. 2 is an enlarged detail sectional view taken along the plane of the line 2-2 of Fig. 1;

Fig. 3 is a face view of a portion of a phonograph disk, with part of a coating broken away, showing a modified construction of insert;

Fig. 4 is a view similar to Fig. 3 but showing another modification;

Fig. 5 is a face view of a modified construction of insert or plug and on a larger scale than in Fig. 1;

Fig. 6 is a face view of a portion of a phonograph disk comprising an outer member and an insert and suggesting a modified method of making the disk;

Fig. 7 is a view similar to Fig. 5 but showing another modification;

Fig. 8 is a detail view showing a portion of a phonograph disk at one step in the improved process of manufacture; and

Fig. 9 is a somewhat similar view but showing the disk following another step in its production.

Referring in detail to the drawings a disk made according to the method of the invention is shown in Figs. 1 and 2 and steps in the method of making said disk being illustrated in Figs. 8 and 9. The complete disk is generally designated 10 and comprises a disk shaped base or member 12 having on either or both sides a coating 11 of lacquer or other material adapted to have a sound groove engraved or cut therein or having sound grooves therein. Base 12 has a rather large diameter opening 13 therethrough and a plate-like insert 14 is secured in said opening.

Base or member 12 is of a frangible or fractureable material, as glass, and insert 14 is of a ma-

terial of a different nature, i. e. a softer material such that an opening may be punched therein without likelihood of fracture of the material about such opening during or following the punching operation. Insert 14 has a phonograph disk locating opening 15 therethrough.

In making my phonograph disk a base 12 of the desired diameter and thickness is provided in disk form. Thereafter the relatively large diameter opening 13 is cut or drilled in the base since (the base being of glass or other rigid brittle substance) the opening cannot be formed by punching without breaking or fracturing the base.

Following the forming of opening 13 one of the inserts 14 is located in such opening. Preferably the insert is of fibre board, cardboard, metal, or other material of a nature to permit of the punching of a hole or holes through it without danger of fracture of the material.

Insert 14 may itself be punched from a sheet of stock and thereafter or as part of the punching operation the insert is provided with slits 16 spaced apart and entering the insert from the outer peripheral edge thereof. These slits are relatively narrow and lend some resiliency to the inserts whereby if the openings 13 vary slightly in size, are not exactly circular, or have rough edges, or the like, the inserts may be sprung into place in the openings and will adjust themselves to the sizes of the openings into which they are sprung.

After the insert is in the opening 13, where it is retained by engagement with the edges of the opening, the coating 11 is applied. This coating is usually applied first to one side and then to the other of the disk. The coating is continuous over each side of the base 12 and the insert 14. This leaves the insert securely enclosed by a film on each of its sides and some other coating material may enter between the contiguous edges of the insert and opening, as at 17, to further secure the insert in place. Space for the coating at 17 may result from deforming of the insert, from the latter having a broken or interrupted edge or from the fact that the edge of the opening 13 is generally rough. Further the coating material enters the slits 16 filling the same and establishing an interlocking connection between the insert and the coating.

Fig. 8 shows the insert in place in the opening 13 of the base prior to the coating of the illustrated side of the disk. Fig. 9 shows the next step in the making of the improved phonograph disk and in such figure the coating 11 has been

applied to the illustrated side of the base and insert. When the coating has been applied to both sides of the disk the next and final step is to punch the locating opening 15 in insert 14 as in Fig. 1. In such operation the outer edges of the otherwise completed disk are used against locating pins or the like so that the opening 15 may be punched in the desired predetermined relation to the outer edge of the disk and usually exactly centrally of the disk.

Locating opening 15 is preferably punched after the coatings have set and therefore when the opening has been made the disk is completed and ready for use. If this opening 15 is made at any time prior to the setting of the coatings the latter are likely to run into the opening so that the latter would then have to be reamed out or otherwise again treated to make the disk ready for use. Further since opening 15 is made by punching its dimensions may be very accurately controlled.

Owing to its flatness, its smoothness and its rigidity glass is preferred for the making of the base 12. However, other materials may be used. The use of glass or other fractureable or frangible materials presents some problems that heretofore have restricted their use in making phonograph disks. Among the difficulties not heretofore overcome was the making of a satisfactory and serviceable locating or mounting opening, as the turntable spindle receiving opening, in the disk. This problem I have overcome.

Base or member 12 may be of any diameter, as, for example, 8, 10, 12, 16, etc., inch phonograph disks and is usually approximately one sixteenth of an inch in thickness. Opening 13 is of the desired diameter and the inserts 14 are preferably of a diameter to have a snug fit in such openings. Slits 16 are in the neighborhood of .005 of an inch in width although this may depend on the diameter, thickness and material of the insert. These slits extend into the insert a distance to have the latter somewhat resilient whereby they may be sprung into openings of slightly smaller diameter or having rough edges or that are not exactly round. With the described structure the inserts will retain themselves in place during the coating operations.

Regardless of the outside diameter of the base 12 it is preferred to have the opening 13 of one diameter in all bases so that inserts 14 of but one diameter need be made up and kept on hand for all diameters of phonograph disks. These inserts 14 are located within the sound groove area of the disk it being understood that the sound grooves in a record will be between the outer periphery of the base 12 and the insert 14. It is here noted that the base 12 is of a non-punchable or fractureable material while the insert 14 is of a punchable non-fracturable material.

Referring to the modification of Fig. 3 the phonograph disk 20 includes a base 21 of glass or other fractureable material, having a relatively large diameter opening 22 therethrough and in which is secured an insert 23 of the material of insert 14. The insert is inwardly of the sound groove area of the disk and is provided with slits 24 for the purpose of the slits 16 of Figs. 1 and 2. A sound groove receiving coating 25 is applied to each side of base 21 and insert 23 and seals the latter in place.

From the above it will be understood that insert 23 is much like insert 14 and the difference

resides in the fact that insert 23 in addition to the central locating opening 26 is provided with three other locating openings 27. All of these openings are formed by punching and usually as the final step in the making of the disk. One or more of the openings 27 is to be used in connection with an eccentric driving pin on the turntable of a phonograph.

To accommodate the additional openings 27 the insert 23 may be of greater diameter than insert 14 although the diameter of the elements is a matter of choice or convenience. Any desired number of locations of the extra openings 27 may be provided and the disk may be used with a turntable not provided with a driving pin or driving pins if that is desired.

In the modification of Fig. 4 the disk 30 comprises a base 31 of glass or the like. This base has a plurality of relatively large diameter openings 32, 33, and 34 drilled therethrough and each receiving an insert 35 similar to the insert 14 first described. Inserts 35 have the slits 36 and locating openings 38 corresponding with the slits 16 and locating opening 15 of insert 14. Continuous coatings 37 of lacquer or other sound groove receiving material are applied to each side of base 31 and the inserts 35 and fill the slits 36 and seal the inserts in place. The final step in the making of disk 30 is the punching of the locating openings 38 in the inserts 35.

All of the inserts 35 are located within the sound groove area of the disk 30 and the inserts may be in the desired positions relative to one another. For example, one insert may be so disposed that its opening 38 will be punched concentric with the outer periphery of disk 30 while the other inserts have their openings located for cooperation with eccentric driving pins on a turntable.

The insert 40 of Fig. 5 may be used in place of any of the inserts previously described and comprises a body 41 made of fibre board, cardboard, metal or the like punchable material and has its edge roughened as by being milled or serrated at 42. Insert 40 having an uneven or broken edge may be forced into an opening slightly smaller than the greatest diameter of the insert and will frictionally retain itself in place during the coating operation. Portions of the lacquer coating material will flow into the milled slots or serrations locking the insert to the coating. Thus insert 40 may be substituted for any of those previously described and may have one or more locating openings punched therein as the final step in the making of a disk.

Fig. 6 suggests a modified process or method of making a phonograph disk. There the disk, generally designated 45, includes a base 46 of glass or other fractureable material in which is cut or drilled a relatively large diameter opening 47. An insert 48 is provided to have a loose fit in opening 47 and is of the material previously described for use in making inserts.

Insert 48 being solid without slits or a rough or broken edge has no resiliency. Since it is purposely made small it has a loose fit in the opening 47. In making disk 45 insert 48 is adhesively held in place and the sides of the base and insert coated with the lacquer or record groove receiving material.

When tape 49 is used as the adhesive it is applied to one side of the base and insert and retains the latter in place while the lacquer coating is applied to one side of the base and insert. Thereafter the disk is reversed and the

tape may be left in place or removed from the base and insert and the second side of the disk coated. In the coating operation some of the coating material flows into the slight space between the insert and the edge of the opening 47 and effectively seals the insert in place. Thereafter a locating opening or openings is or are punched in the insert.

Fig. 7 shows another modification of insert generally designated 50 and adapted to be substituted for any of the inserts previously described when making a phonograph disk. Insert 50 is a disk relieved along a portion of its edge whereby it is not a true circle but has a slightly greater diameter along the line A—B 15 than along the line C—D. That is, over a considerable arc as suggested by the distance between the dotted line 51 and the full line 52, the disk is relieved.

For example, where the disk has a diameter along the line A—B of .750 inch it has been found satisfactory to reduce it over an arc of approximately 120 degrees to have its diameter along the line C—D approximately .740 inch. These dimensions are only suggested and are not to be considered as limiting.

A slit 53 is formed in the disk and extends in the direction of the short diameter thereof entering from one edge and preferably extending more than one-half the distance across the insert. Owing to the presence and location of this slit 53 the insert 50 may have its diameter along the line A—B reduced by squeezing its portions inwardly reducing the width of the slit or even closing the open end portion thereof.

Thus it will be understood that insert 50 may be inserted into an opening which is not truly circular or which is of a diameter less than that of the insert when measured along the line A—B and that the disk will expand and hold itself in place in an opening into which it has been placed. The insert 50 has certain manufacturing advantages over the insert 14 but otherwise it may be substituted for any of the inserts heretofore described.

It is to be understood that in the foregoing description and in the appended claims the words phonograph disk are used to designate either a sound record or a sound record blank, in the form of a disk. Additionally it is pointed out that the inserts preferably are of a thickness to lie within the planes represented by the side surfaces of the base so that a series of the completed disks may be stacked one on the other and lie flat so that they may be handled without breakage should they be tightly gripped while so stacked. A trade-name or trade-mark or the like may be stamped or embossed in or on the insert of punchable material without damage to the completed disk.

Having thus set forth the nature of my invention, what I claim is:

1. The method of making a phonograph disk comprising forming a large opening in a member of fractureable material, placing in said opening an insert of a material adapted to have an opening punched therein without causing fracture of the material, applying a film of sound groove receiving material to said member and said insert and thereby sealing the latter in place, and then punching a locating opening in said insert.

2. The method of making a phonograph disk comprising forming a large opening in a member

of fractureable material, placing in said opening a punchable insert having a loose fit therein, applying a tape to one side of the member and insert to prevent the latter from falling from the former, applying a film of a sound groove receiving material to a side of the member and insert whereby the former is prepared for the reception of a sound groove and the latter is sealed to the former, and then punching a locating opening in said insert.

3. The method of making a phonograph disk comprising drilling an opening in a body member of fractureable material, placing an insert of non-fracturable material in said opening in frictional engagement with the edges thereof, and then sealing said insert in place with a film of sound groove receiving material extending onto both the member and insert.

4. The method of making a phonograph disk comprising drilling an opening in a body member of fractureable material, placing an insert of non-fracturable material in said opening, adhesively supporting said insert in said opening, and then sealing said insert in place with a film of sound groove receiving material extending onto both the member and insert.

5. The method of making a phonograph disk comprising forming an opening in a body member of fractureable material, sealing an insert of non-fracturable material in said opening, and then punching an opening through the insert in predetermined relation to the outer edge of the member.

6. The method of making a phonograph disk comprising forming an opening in a body member of fractureable material, then placing a compressible insert in said opening and permitting the insert to expand into engagement with the edges of the opening, and then sealing the insert to said member by a film extending onto both the member and insert.

7. The method of making a phonograph disk comprising forming an opening in a body member of fractureable material, placing an insert of pliant material in said opening and locking it therein by expansible means, and then sealing said insert in said opening and covering the sides of said body with films of sound groove receiving material.

8. The method of making a phonograph disk comprising forming an opening in a disk of fractureable material, placing an insert of non-fracturable material in said opening, and locking the insert in said opening by expansible means and a film of sound groove receiving material extending over one side of said member and onto said insert.

9. The method of making a phonograph disk comprising forming a plurality of openings in a body member of fractureable material, placing an insert of non-fracturable material in each of said openings, and then sealing all of said inserts in place with films of sound groove receiving material applied to each side of said member and extending onto said inserts.

10. The method of making a phonograph disk comprising forming a large opening in a member of fractureable material, placing in said opening an insert of non-fracturable material, applying to each side of said member and said insert in liquid form a coating of a material adapted to set and form a film of sound groove receiving material on said member.

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