

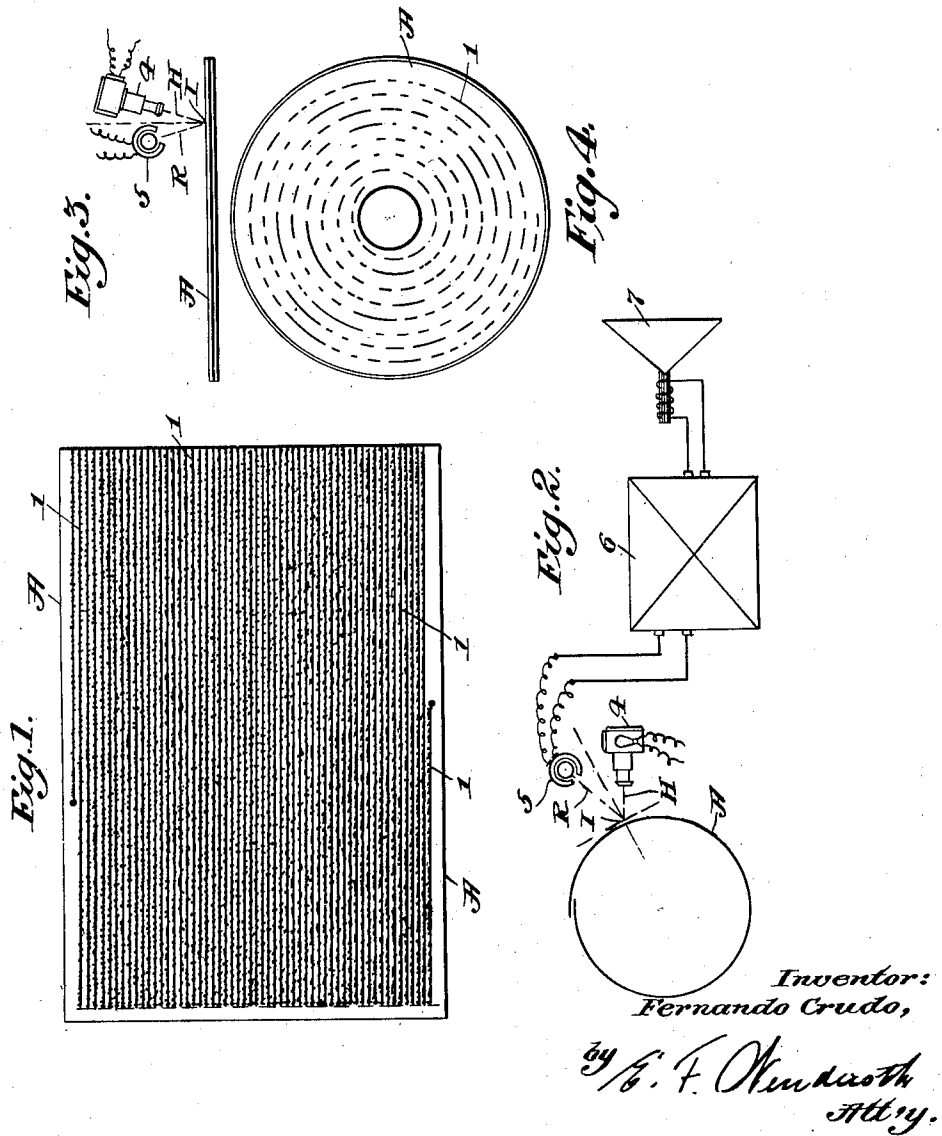
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SOUND RECORD FOR OPTIC SOUND REPRODUCTION

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## UNITED STATES PATENT OFFICE

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SOUND RECORD FOR OPTIC SOUND  
REPRODUCTION

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5 Claims. (Cl. 41—25)

The present invention relates to the obtention of new sound records for optical sound reproduction, in the form of a sheet of paper or any suitable material, carrying the sound record tracks, in continuity or in segments, which are arranged next to each other, phonetically correlated with each other.

This constitutes a great novelty and economy as concerns sound records, as heretofore those sound records which have been shaped as sheets have been multiplied only by photographic means.

The copying of the sound records can be effected through the known photographic processes or the conventional printing processes.

The present invention differs from the prior methods in that printing means and printing inks or substances are used for multiplying the sound records, instead of photographic methods as heretofore.

Ribbon-shaped sound records are also known, the multiplication of which is effected by means of printing. The present invention differs from these, in that instead of being ribbon-shaped, the sound records are in the form of sheets, and are practical for use on commercial scale, as in letters, newspapers, etc.

Due to this sheet-like shape, the new sound records carry the sound track disposed in a compact manner on the sheet, the sound track following a spiral line or constituting a plurality of juxtaposed, substantially parallel tracks.

Due to the sheet-like shape of the new sound records and to the fact that copies thereof are obtained by ink or other printing substances and printing plates, my new method of multiplying the sound records is extremely simple and the cost of the sound records is greatly reduced. Where the term "printing" is used hereinafter, both in the specification and claims, it is to be understood that I mean mechanical printing processes, as differentiated from photographic processes.

Owing to the characteristics of these new sound records, it is feasible to publish sound records in newspapers and magazines, ready for reproduction by suitable reproducing machines.

The printing plates used for the multiplication of the sound records, may be obtained from negatives which have been previously impressed by photoelectric sound recording methods.

The new sound records, as already stated above, assume the shape of a sheet. This sheet may be circular, square, rectangular or of any other sheet shape.

The material used may be opaque or trans-

parent, according to the characteristics of the sound reproducing machine used, whether it is reproduced by means of light passing through the sound record or reflecting thereon. Any suitable material may be used, preferably paper or celluloid.

In order that the invention may be more clearly understood, it has been illustrated in the accompanying drawing, which shows the sound record in two of its preferred forms and in one of the manners in which it may be phonetically reproduced, viz., by the reflection of light.

Figure 1 is a plan view of a sound record, which in this case assumes the shape of a rectangular sheet, with straight parallel sound tracks; as stated hereinbefore, this sound record preferably is printed by means of printing plates and ink or other printing substances.

Figure 2 shows the manner in which the sound record illustrated in Figure 1 can be wound into a cylinder shape, in order to obtain the continuity of the tracks which form a helicoidal line for the reproduction thereof by means of the analyzing and amplifying devices, as shown in this same figure.

Figure 3 is a side view of a circular sound record having a spiral track and showing its relation with the analyzing devices of the sound reproducing machine.

Figure 4 is a plan view of a sound record of the same type as shown in Figure 3.

The same reference characters indicate like or equivalent parts or elements throughout the different drawings.

With reference to the drawings, A are the sound records which, as stated above, are printed by means of printing plates and printing substances, the said printing plates being obtained from previously recorded negatives.

One of the different ways of recording the sounds on the negatives, is as follows:—

A sensitized film, in the shape of a sheet, is applied around the rotating cylinder of a sound recording apparatus. The negative is impressed by means of an oscillograph or other device which converts the sound vibrations received by a microphone into light vibrations. These light variations impress the negative in a helicoidal track which is obtained upon synchronizing the rotation of the cylinder with a very slow transverse displacement of the oscillograph or inscribing device.

Once unrolled, the negative, when developed and fixed, presents the sound record in the form of straight parallel tracks.

Suitable mechanical devices may be used to obtain sound record negatives having the tracks arranged differently to those previously described.

The printing plate is then prepared from the negative thus obtained; said printing plate may be photolithographic, the obtention of the printing plate from the negative being effected in the usual manner.

This printing plate may be adapted to flat or rotary printing machines and by means of ink or other printing substances the sound record is printed on paper, celluloid or any other transparent or opaque material having the form of a sheet.

The printed material is thus converted into a sound record, capable of being reproduced by means of suitable sound reproducing apparatus.

These apparatus should have suitable mechanical devices according to the different sound record tracks, and should be of the same sheet shape as said sound records.

The most practical shapes of sound records are the rectangular sheets which may be rolled into a cylinder, as illustrated in Figures 1 and 2, or the circular shape as illustrated in Figures 3 and 4.

If the sound record A is transparent, it will operate between a light focus and a photoelectric cell, but if it is opaque it will operate by the reflection of the light, as is illustrated in Figures 2 and 3, that is to say, having the light focus 4 and photoelectric cell 5 arranged on the same side of the sound record, in such a manner that on initiating the movement of the sound record A, the light focus 4 will direct a pencil of rays H towards the track 1. Upon falling on the point I, scanning the same, the light beam is reflected, constituting the reflected pencil of rays R, which pencil of rays is affected by fluctuations produced by the movement of the sound record track; the luminous variations of this ray R are impressed on the photoelectric cell 5, which converts them into electrical variations, which upon being amplified in the audio-frequency circuit 6, are converted into sounds by the loudspeaker 7.

It is evident that in carrying this invention into practice, it may be subject to modifications in the shape and general structure of the sound records, without departing from the scope of the appended claims.

I claim:

1. A phonogram recorded by photoelectric or

similar process, having the shape of a sheet and being free throughout its entire perimeter, said sheet having the sound record tracks arranged in the form of multiple straight parallel tracks corresponding to a transversely cut helicoidal track, in such a manner that the parallel tracks are adapted to comprise a continuous sound record.

2. A phonogram recorded by photoelectric or similar process, having the shape of a sheet the two dimensions of which are approximately equal and which is free throughout its entire perimeter, said sheet having the sound record tracks arranged in the form of multiple straight parallel tracks corresponding to a transversely cut helicoidal track, in such a manner that the parallel tracks are adapted to comprise a continuous sound record.

3. A phonogram recorded by photoelectric or similar process, having the shape of a sheet the two dimensions of which are equal and which is free throughout its entire perimeter, said sheet having the sound record tracks arranged in the form of multiple straight parallel tracks corresponding to a transversely cut helicoidal track, in such a manner that the parallel tracks are adapted to comprise a continuous sound record.

4. Process for the manufacture of phonograms recorded by photoelectric or similar means, comprising recording the sound in a helicoidal line on a carrier applied over a rotary cylinder, withdrawing said carrier from the cylinder, developing and fixing the carrier, obtaining copies thereof on sheets of suitable material free throughout their entire perimeter, in such manner as to arrange the sound record tracks thereon in the form of multiple straight parallel tracks corresponding to the helicoidal track transversely cut.

5. Process for the manufacture of phonograms recorded by photoelectric or similar means, comprising covering a cylinder with a sensitized sheet carrier the two dimensions of which are approximately equal, joining two of the borders of the sheet carrier on the cylinder, rotating the cylinder and thereby recording the sound in a helicoidal line, withdrawing said carrier from the cylinder, developing and fixing the carrier, thus presenting the tracks arranged in the form of multiple straight parallel tracks corresponding to the transversely cut helicoidal track, later using the said carrier to obtain copies on sheets which are free throughout their entire perimeter.

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