

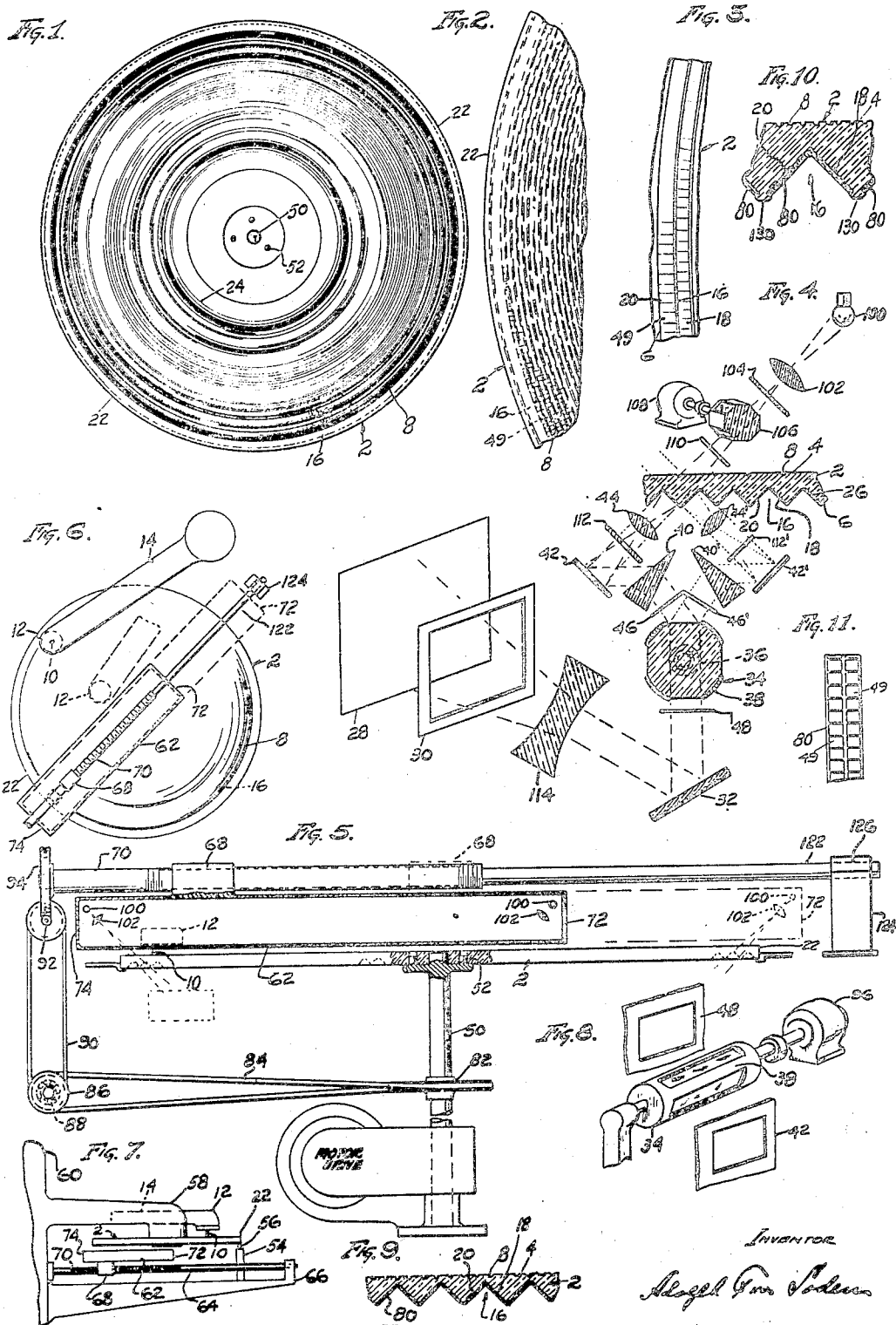
Dec. 7, 1948.

A. F. VON SODEN

2,455,712

RECORDING DISK FOR SOUND AND PICTURES

Filed Feb. 25, 1947



UNITED STATES PATENT OFFICE

2,455,712

RECORDING DISK FOR SOUND
AND PICTURES

Adolph F. von Soden, Los Angeles, Calif.

Application February 25, 1947, Serial No. 730,837

6 Claims. (Cl. 88—16.2)

1

My invention relates to means for producing pictures and sound on recording discs or the like, and means for reproducing same therefrom.

Accordingly an object of my invention is to provide a disc means, having an angular structure and progressively spiral groove means therein, also having a sound track on said disc, each of which is cut spirally and terminating at the center or at the outer rim section of said disc, said sound track being for recording the sound vibrations thereon and said angular spiral groove being for recording pictures in consecutive succession.

A further object of my invention is to provide said angular groove of said disc with suitable photographic emulsion, which may be coated or suitably deposited thereon, and adapted for recording picture frames upon the angular surfaces of said groove.

Another object of my invention is to provide said disc with a layer of photographic emulsion, for recording the sound and for providing a sound track thereon.

Another object of my invention is to provide said disc with an angularly spiral groove means upon one surface side thereof, and having a suitable sound groove upon the opposite surface side, for providing a picture track and the sound track thereon.

Further object of my invention is to provide suitable means for recording sound and picture frames upon said disc and upon the surface of said spiral groove means, and to reproduce said pictures including said sound recorded thereon.

Another object of my invention is to provide a method and means for reproducing and for transmitting the sound including the pictures from said disc upon a suitable screen, and for carrying on said reproduction of sound and pictures from either surface of said spiral groove means, without changing the rotation or turning movement of said disc.

Further object of my invention is to provide a suitable detachable adaptor means, adapted to be attached on and be made a part of any standard sound from disc reproducing machine or apparatus, also having driving means associated therewith for controlling the position of said adaptor means during the turning movement of said disc and while the sound and the picture is reproduced therefrom.

My invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, econom-

2

ical in manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description.

Reference is now had to the accompanying drawings in which the similar reference characters denote the same parts.

In the drawings:

Fig. 1 shows a top plan view of the disc.

Fig. 2 shows a fragmentary and slightly enlarged view of a disc, showing plurality of picture frames and a sound track.

Fig. 3 shows an enlarged view of the angularly grooved section of the disc, on which picture frames are photographed.

Fig. 4 shows the schematic view of the method used in photographing pictures and for providing sound track upon the surface of the disc, and also means for reproducing said sound and pictures therefrom.

Fig. 5 shows an enlarged side and partly sectional view of the adaptor, applicable for a standard phonograph machine, and adapted for reproducing pictures from said disc.

Fig. 6 is a top plan view of the disc, showing same in relation to the sound reproducing diaphragm provided with an arm member and also showing said disc in relation to the picture reproducing adaptor.

Fig. 7 is a fragmentary side elevational view of a sound and picture producing machine.

Fig. 8 is a fragmentary perspective view of the prism in relation to the apertures and means for driving said prism.

Fig. 9 is an enlarged sectional view of the disc showing a layer of film provided within the groove thereof, showing said disc in a modified form.

Fig. 10 is a fragmentary sectional view of a disc with a strip film in position, shown in modified form.

Fig. 11 is a fragmentary plan view of a strip film.

Describing my invention more in detail, in its broader aspects, said invention comprises a disc 2 having a top side 4 and the bottom side 6.

Said top side 4 is provided with a sound groove 8 wherein sound vibrations are imprinted, and from which said sound is reproduced when the needle member 10 of the diaphragm member 12 comes in contact therewith, and which is mounted upon a swinging arm member 14.

The underside or bottom part side 6 of said disc is provided with a spiral groove 16 having

angular sides 18 and 20, which groove starts and begins at the rim section 22 and terminates at the center section 24 of said disc.

Said disc 2 is translucent, being made out of glass or other suitable transparent material, and the surface thereof is coated with suitable photographic emulsion, shown as layer 26, in Fig. 4, on which a plurality of pictures are photographed.

In photographing said plurality of pictures on said groove surfaces 18 and 20, suitable means are used for bringing the picture from the screen 28 or living persons through the frame 30 upon an angularly disposed reflection 32, which reflects the picture upon a suitable prism 34 which is revolvably mounted upon a shaft 36.

Said prism 34 is held within a suitable housing member 38 for providing four parallel faces of the prism, through which the light rays carry said picture into a suitable prism 40 and upon reflector 42, then causing said light rays to pass through a suitable lens 44 and upon the surface of said groove 16.

It may be noted that said prism 34 may be so arranged whereby eight or sixteen parallel faces of the prism may be had.

The linear surface speed of said groove 16, when said disc 2 is turning, is so arranged in relation to the rotative speed of said prism 34, whereby each picture frame is photographed successively, thus photographing movements and motions of the persons or the moving picture reproduced upon said screen 28 from a projection machine.

In order to control the angular tilt in prisms for light rays passing through said prism 34 and said prism 40 including reflector 42, suitable aperture plates 46 and 48 are provided, as shown.

In this manner a plurality of pictures 49 at rapid succession and relatively small are photographed upon the surfaces 18 and 20 of said groove 16 during the rotative movement of said disc 2, each frame picture being sharp and individual.

As shown in Fig. 5 said disc 2 is mounted upon a center shaft 50 and is anchored in proper place and position by means of suitable pin members 52 for preventing the sound and the picture from falling out of synchronism.

In manufacture of said discs, that is for taking pictures and the sound upon said discs 2, the rim 22 is supported in position by means of a stand 54 provided with a roller 56, and said disc 2 is suspended upon a driving arm 58 of a machine 60 as shown in Fig. 7, so that the sound track or groove 3 may be taken on the top side 4, while at the under side of said disc a suitable housing 62 is provided, wherein said reflector 32, prism 40 and reflector 42 including the lens 44 with their respective apertures 46 and 48 are mounted, and also having therein said prism 34 which is rotated by means of a suitable motor (not shown).

Said housing 62 is mounted on a suitable guide member 64 one end of which is mounted within a bearing 66 while the other end is mounted within the machine frame 60.

Said housing is suitably supported in place for preventing its tilting, and also is provided with a threaded bearing 68 adapted for receiving a suitable feed screw 70.

When in operation, said disc 2 disposed horizontally, turns in one direction by being actuated by a driving mechanism (not shown) in said driving arm 58, and allowing the sound track 3 to be imprinted upon the top surface 4.

During the turning of said disc 2 said housing 62 moves by the feed screw 70 toward and over the center, until the housing end 72 will reach the outer rim section 22 of said disc.

Within said housing 62 the optical apparatus such as prisms, apertures, lens and reflector, are so arranged, whereby the focusing of the passing light rays will be directed at an angle, as shown in Figs. 4 and 5, said optical apparatus being located at the housing ends 72 and 74, so that when said housing 62 is fed toward the center of said disc, then the optics located in end 74 will operate, at the angular surface 20 and upon reaching the rim section 22 then the optics located in end 72 will operate at the angular surface 18, said disc 2 continuing in its rotation and the only feed screw 70 reversing its movement causes said housing 62 to move back to its original starting position.

A suitable switch (not shown) may be arranged at the housing ends 72 and 74 for the purpose to provide the electrical current for the clutch (not shown) which may be necessary when photographing the picture upon said disc, and with which to control the forward and the return movement of said housing, as hereinbefore provided.

It may also be noted, that said disc 2 may be coated with suitable photographic emulsion and properly prepared for taking pictures on the surfaces 18 and 20 of said groove 5, or, if so desired, a suitable film band 80 properly sensitized may be pressed into said groove 16, on which the pictures have been previously photographed, as shown in Fig. 9.

For reproducing the picture and the sound from said disc 2, a suitable adaptor is provided, which consists of a drive pulley 82, mounted upon the center shaft 50, said pulley 82 is provided with a drive belt 84 leading to and connecting a suitable sub-drive 86 provided with a reversible clutch 88, and which connects by means of belt 90 with a worm drive member 92 and a worm gear 94 with which to drive said feed screw 70 and thereby moving said housing 62 into its forward and reverse positions.

Said housing 62 in construction is the same as disclosed and illustrated in Fig. 7, wherein the prism 34 with the driving motor 96, shown in Fig. 8 and the apertures 42 and 48 are eliminated.

Said housing 62, however, is provided with two sets of source of light 100 and lens 102, each mounted at an angle to correspond with the angular surfaces 18 and 20 in said groove 16 of the disc 2, as shown in Fig. 4.

Each end 72 and 74 is provided with identical optical apparatus, consisting of said light source 100 a lens 102 having an aperture 104 and a parallel face prism 106 operated at a suitable revolution and speed by means of a motor 108, also having a secondary aperture 110 which direct the light rays upon said disc 2 and the picture surface 18, or 20, of said groove 16, thus allowing pictures 49 to be reproduced.

The light rays then pass through lens 44 and aperture 112 to reflector 42 through prism 40 to reflector 32 and through the double concave lens 114.

The light rays passing through said concave lens 114 are directed past the aperture or frame 30 unto the screen 23 which may be a frosted glass or the like.

It may be noted, that the revolving prism 106 when positioned in place of the prism 34, for

reproducing the pictures 48, will equally be effective.

Also, the same procedure is employed, in reproducing said pictures 48 from said disc 2, which has been described for photographing said pictures on said disc, in that, said housing 62 is moved toward the center and over said disc, while it is rotating, the picture is picked up from the angular side 20 of said groove 16 by the optical apparatus disposed in the end 74 of said housing 62, and then, when said housing end 72 reaches the opposite rim 22, as shown in Fig. 5, then the optical apparatus mounted in said housing end 72 will pick up the pictures upon the side surface 18 of said groove 16, the clutch 88 in reversing the rotation of said feed screw 70 will cause said housing 62 to move into its starting position.

When the movement of said housing 62 is reversed then the source of light 100 in the housing end 74 will be extinguished by means of a suitable switch (not shown), thus allowing the illuminating and the optical members disposed in housing end 72 to operate.

In this manner, when the optical apparatus disposed in housing end 74 are employed, for reproducing the picture provided upon the surface 20 of said groove 16, as shown in Fig. 4, then the optics such as lens 44', the aperture 112', reflector 42' the prism 40' and the aperture 46' are used, and for reproducing pictures from the surface 18 of said groove 16 then the optics disposed at an opposite angle, as shown, are utilized.

In order to hold said feed screw 70 in position and also for preventing said housing 62 from tilting, said feed screw is provided with an extension end 122 which is mounted in a suitable bracket member 124.

For removing said disc 2 from its mounted position, said bracket member is provided with a detachable cap member 126, therefore allowing said feed shaft 70, with said housing member 62, to be lifted upwardly and thus allowing sufficient clearance for said disc 2 to be removed and another replaced in its place.

In Fig. 10, said disc 2, shown in cross-section, discloses a modification of its construction at the groove 16, which is provided with suitable ledge member 130, so that a previously prepared narrow film, as shown in Fig. 11, may be placed within said groove and be held in position by means of said ledge 130 when pressed into and against the surfaces 18 and 20.

Also, it may be noted, that a circular film member properly provided with picture frames 48 may be used and then pressed into position over said grooves 16 and thereby simplifying the manufacture of said discs 2, as shown in Fig. 9.

While I have thus described my invention with great particularity, it will be clear that the same may be modified throughout a wide range.

I accordingly do not propose to be limited to the exact details of construction herein shown on the drawings and described in the specification, but reserve the rights in practice to make the necessary changes and modifications therein, which may come within the scope of the appended claims.

I claim as my invention:

1. In a disc of the class described, comprising a top and bottom surface sections, a spiral and angular groove in said bottom section of said

disc having two sides, a photographic film on said angular sides of said spiral groove provided with photographic emulsion, and sound track grooves upon the top surface section of said disc.

2. In a disc of the class described, as described in claim 1, optical means in close proximity to said angular sides of said spiral groove of said disc for photographing picture frames thereon in consecutive succession, and sound track grooves upon the opposite surface side of said disc for reproducing the sound of the persons depicted in said pictures photographed on said disc.

3. In a disc of the class described, comprising an angularly spiral groove in the bottom section of said disc, a ledge means at the outermost edge of said groove, a strip film provided with picture frames disposed within said spiral groove and upon the angular surfaces thereof and held in place by said ledge means, and sound track grooves upon the top section surface of said disc.

4. In the apparatus of the class described, comprising a disc means having an angular two sided groove arranged spirally upon the underside surface of said disc, a sensitized film means disposed upon said sides of said spiral groove, and means in said apparatus for photographing pictures of consecutive succession upon said sensitized film means.

5. In the apparatus of the class described, comprising a disc mounted upon a vertical rotatable shaft, a two sided angularly spiral groove upon the bottom surface side of said disc, a sensitized film strip mounted upon said sides of said spiral groove, means in said apparatus for imprinting the sound upon the top surface of said disc means, means in said apparatus for photographing pictures in consecutive successions on said sensitized film strip in said disc means, and means in said apparatus for controlling the position of said sound imprinting means and for controlling the position of said picture photographing means, during the operation of said apparatus.

6. In the apparatus of the class described, comprising a disc means rotatably mounted upon a vertical shaft in said apparatus, said disc means having an angularly spiral groove, a picture film strip mounted upon the angular sides of said spiral groove, a rotatable parallel faced prism means in said apparatus for reproducing the photographed consecutive pictures from said picture film strip in said spiral groove of said disc means into continuous moving pictures upon a screen.

ADOLPH F. VON SODEN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,609,949	Kern	Dec. 7, 1926
1,641,727	Bradford	Sept. 6, 1927
1,933,057	Harkin	Oct. 31, 1933
2,005,914	Freund	June 25, 1935
2,203,437	Levy	June 4, 1940
2,346,472	Contner	Apr. 11, 1944

FOREIGN PATENTS

Number	Country	Date
459,537	France	Sept. 8, 1913