Oct. 25, 1949. D. L. O'DEA 2,485,839

MAGNETIC-PHOTOGRAPHIC RERECORDING SYSTEM

Filed April 29, 1948

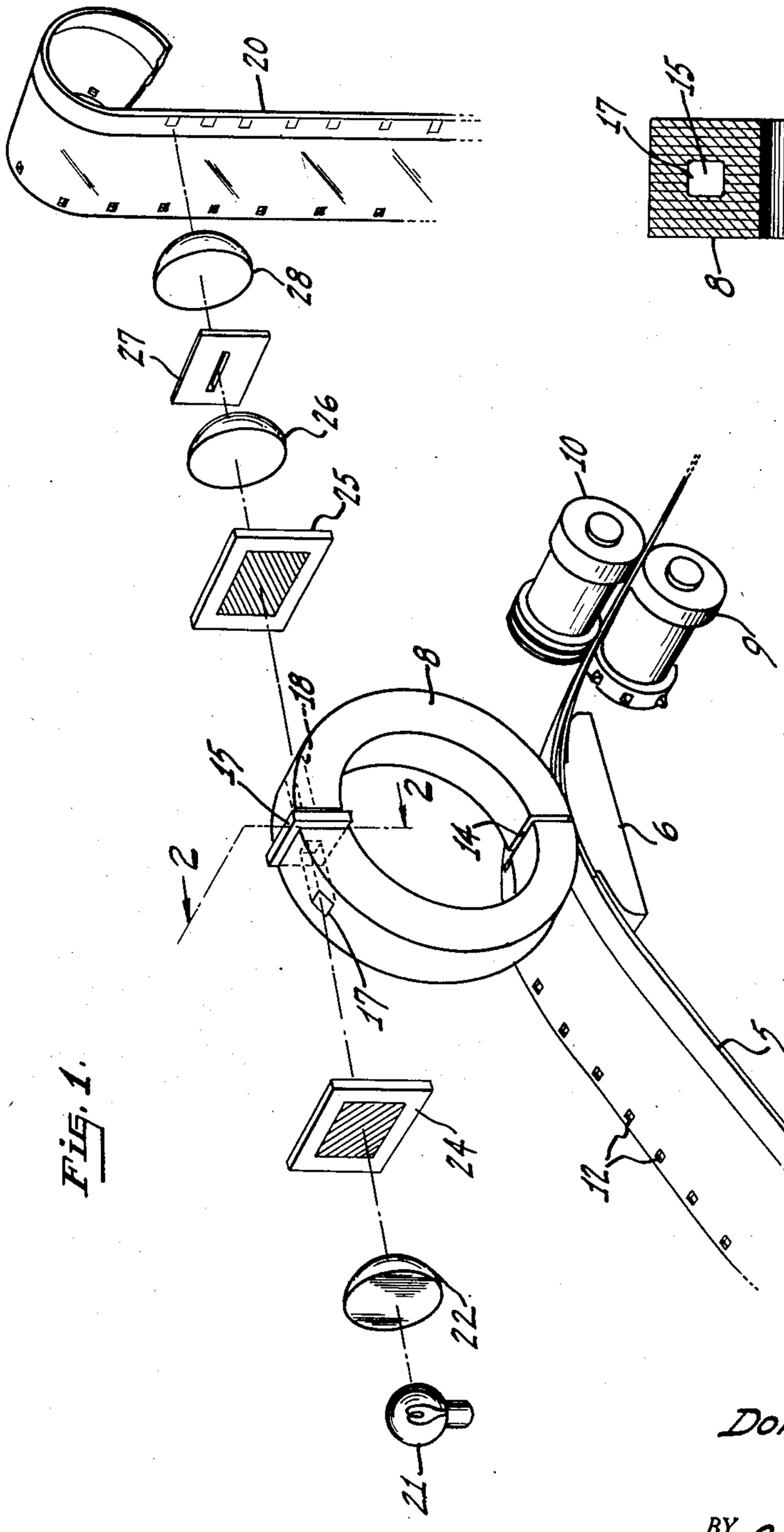

Fig. 1.

Fig. 2.

DOROTHY L. O'DEA,
INVENTOR.

BY Orl R. Goshaw

ATTORNEY

Patented Oct. 25, 1949

2,485,839

UNITED STATES PATENT OFFICE

2,485,839

MAGNETIC-PHOTOGRAPHIC REERECORDING SYSTEM

Dorothy L. O'Dea, Los Angeles, Calif., assignor to Radio Corporation of America, a corporation of Delaware

Application April 29, 1948, Serial No. 23,897

7 Claims. (Cl. 179—100.3)

1

This invention relates to sound recording and reproduction, and relates particularly to a record transfer method and system whereby a magnetic type of record may be rerecorded to a photographic type of record.

It is well-known that sound may be recorded on disc phonograph records, on photographic film, on magnetic wire, and on magnetic tape. Photographic sound records on film have been used in the production of sound motion pictures for many years, and recently magnetic sound records on tape or film have been used. The advantage of magnetic recording resides in the feature that it may be immediately reproduced, which is particularly desirable in the production of motion pictures whereby the actors, artists, and directors desire an immediate check on the record made before passing on to the next scene or before the set is dismantled. However, before the sound track may be released, it must be rerecorded to a photographic sound record so as to be combined with the picture and reproduced in theaters which are equipped with photographic sound reproducing apparatus.

The present invention is directed to a rerecording method and system for transferring a magnetic record to a separate photographic film, or, if desired, to the same film carrying the magnetic record, but on which a photographic emulsion is also present. The principle of light rotation by stresses in dense glass is utilized in making the transfer. That is, the magnetic record varies the magnetic field in a thin glass plate through which the recording light beam is passed. The stresses in the plate modulate the light which is then projected to a separate photographic film or to a photographic emulsion on the magnetic film.

The principal object of the invention, therefore, is to facilitate the transfer of a magnetic record from a magnetic record carrier to a photographic record carrier.

Another object of the invention is to provide an improved method of and system for rerecording a sound record from a magnetic tape film to a photographic film.

A further object of the invention is to provide an improved rerecording system between magnetic and photographic record mediums.

Although the novel features which are believed to be characteristic of this invention will be pointed out with particularity in the appended claims, the manner of its organization and the mode of its operation will be better understood by referring to the following description read in

2

conjunction with the accompanying drawings, forming a part hereof, in which:

Fig. 1 is a diagrammatic, perspective drawing of a rerecording system embodying the invention, and

Fig. 2 is a cross-sectional view of the light modulator taken along the line 2—2 of Fig. 1.

Referring now to the drawings, a magnetic tape or film 5 is pulled between a shoe 6 and a laminated, circular core 8 by a sprocket 9 having a pad roller 10 thereon. Although the magnetic tape is shown as one having a single row of perforations or sprocket holes 12, and the sprocket 9 has teeth at one end thereof, it is to be understood that the magnetic record carrier may be on a tape or film having a double row of sprocket holes, or may be on a tape without perforations which is then driven by a capstan.

The core 8 has a small gap provided by insulation 14 and a larger gap diametrically opposite in which is a dense glass sheet 15 of approximately one-half a mil thick. The core 8 has openings 17 and 18 on each side of the plate 15 so that light may be passed through the plate 15, as shown in Fig. 2.

The optical system for recording a record on a photographic film 20 includes a constant intensity light source 21, a condenser lens 22, a polarizing sheet 24, a second polarizing sheet 25, a lens 26, a slit mask 27, and a projection lens 28. The film 20 may be a thirty-five millimeter strip with a double row of perforations, or may be sixteen millimeter with a single row of perforations. With no magnetic tape passing the gap 14, the two polarizing sheets 24 and 25 are arranged so that no light, or a very small amount of light, will pass to the film 20. However, if any rotation of the light beam occurs by stresses in the plate 15, light will pass the plate 25 to the film 20 in an amount depending upon the degree of stress in the plate 15.

Thus, to transfer a magnetic record on the tape 5 to a photographic record on the film 20, the tape 5 is advanced past the gap 14, causing various degrees of strain in the plate 15 which will vary the quantity of light reaching the film 20, and a variable density type of record corresponding to the magnetic record will be recorded on film 20. If the tape 5 also carries a photographic emulsion, it could be directed to the position of film 20 and have a photographic record recorded thereon. The glass plate 15 may also be positioned at the gap 14 with the necessary light passing openings in the core 8, as shown at 17 and 18. The glass plate 15 is preferably dense flint having a high index of refrac-

tion, while the tape or film 5 may be advanced across the gap 14 with a reversed curvature to that shown, thus eliminating the shoe 6.

I claim:

1. A sound record transfer system comprising a medium carrying a magnetic sound record, a photographic emulsion adapted to have a sound record recorded thereon, a magnetic core having a pair of gaps therein and in which the magnetism is varied by said magnetic record passing one of said gaps in said core, an optical system for directing light to said photographic emulsion, a pair of crossed light polarizing elements in said optical system, and a light rotating element in said other gap of said core for modulating the light in accordance with the degree of magnetism in said core produced by said magnetic record.

2. A sound record transfer system in accordance with claim 1, in which said light rotating element is a dense glass plate said light passing through openings in said core and said glass.

3. A rerecording system for transferring a magnetic record to a photographic film comprising a magnetic core having a pair of diametrically positioned gaps therein, a thin glass plate located in one of said gaps in said core, means for impressing a light beam of constant intensity on said glass through an opening in said core, means for advancing a magnetic record past said other gap in said core for varying the magnetism therein and in said glass, thereby modulating the light emerging from said glass, and an optical system for projecting said modulated light to said film.

4. A rerecording system in accordance with claim 3, in which said light passing means and said light projecting means include a light source of constant intensity, a polarizing element between said source and said core, and a second polarizing element between said core and said film.

5. A rerecording system in accordance with claim 3, in which said thin glass plate is of dense flint glass having a high refractive index.

6. A rerecording system for making a photographic record from a magnetic record comprising a core having a pair of gaps therein and adapted to be magnetized, means for passing a magnetic record past one of said gaps for magnetizing said core in accordance with the magnetic variations of said record, and a photographic sound recording unit including a light modulator in said other gap of said core, the variations in magnetism of said core actuating said modulator.

7. A rerecording system in accordance with claim 6, in which said light modulator is a dense flint glass having a high refractive index and said core has openings therein on each side of said glass through which the recording light passes.

DOROTHY L. O'DEA.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
1,961,706	Pajes	June 5, 1934
2,039,742	Schinzel	May 5, 1936
2,165,307	Skellett	July 11, 1939