April 8, 1941. J. M. KUHLIK 2,237,738

SOUND TRANSLATING EQUIPMENT

Filed March 22, 1939 2 Sheets-Sheet 1

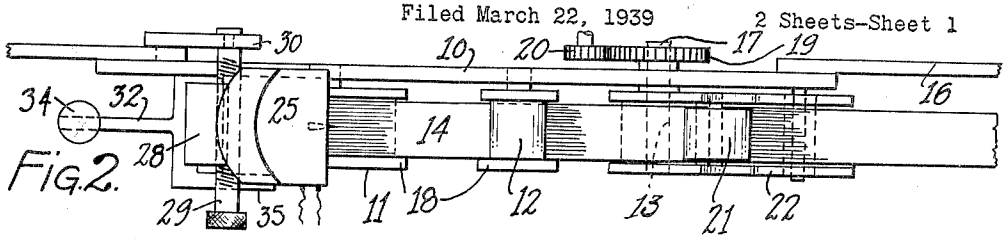


FIG. 2.

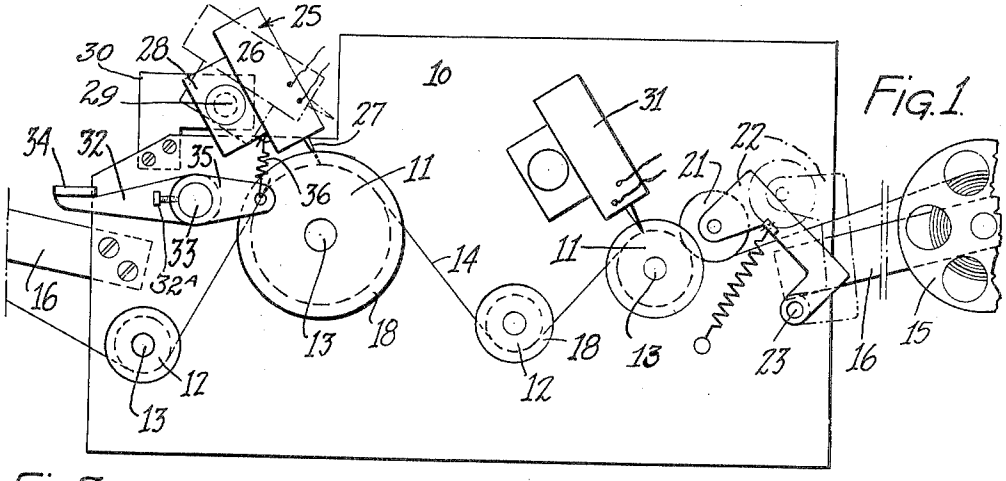


FIG. 1.

FIG. 3.

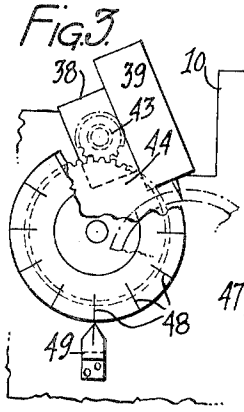


FIG. 4.

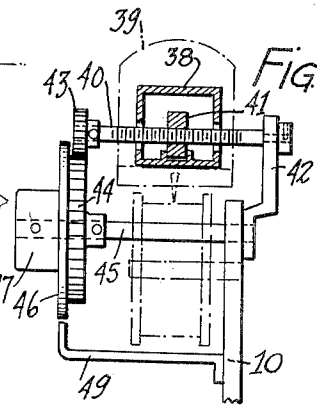


FIG. 5.

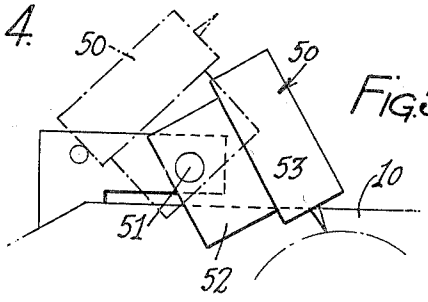


FIG. 6.

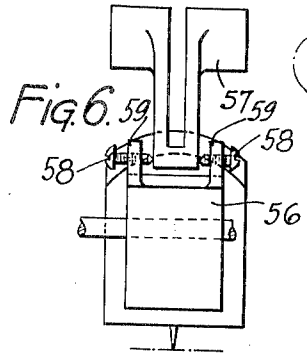


FIG. 7.

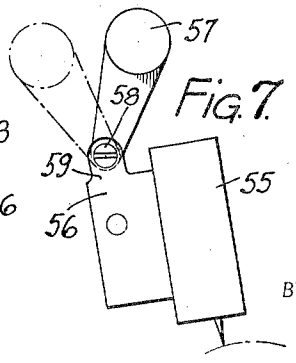
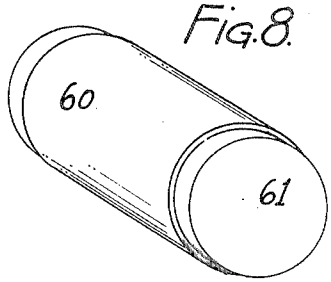


FIG. 8.



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SOUND TRANSLATING EQUIPMENT

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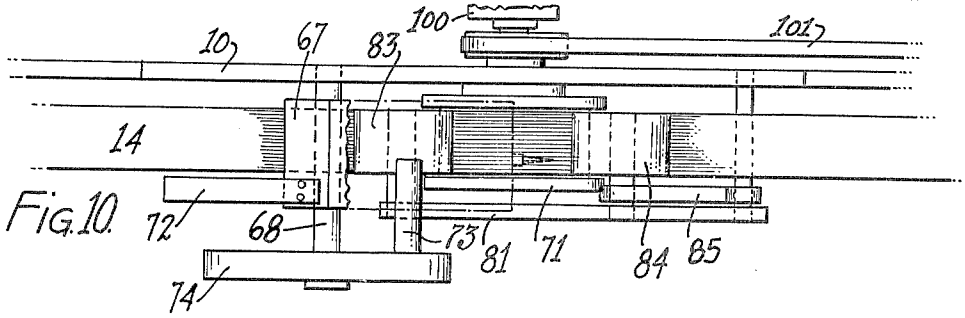


FIG. 10.

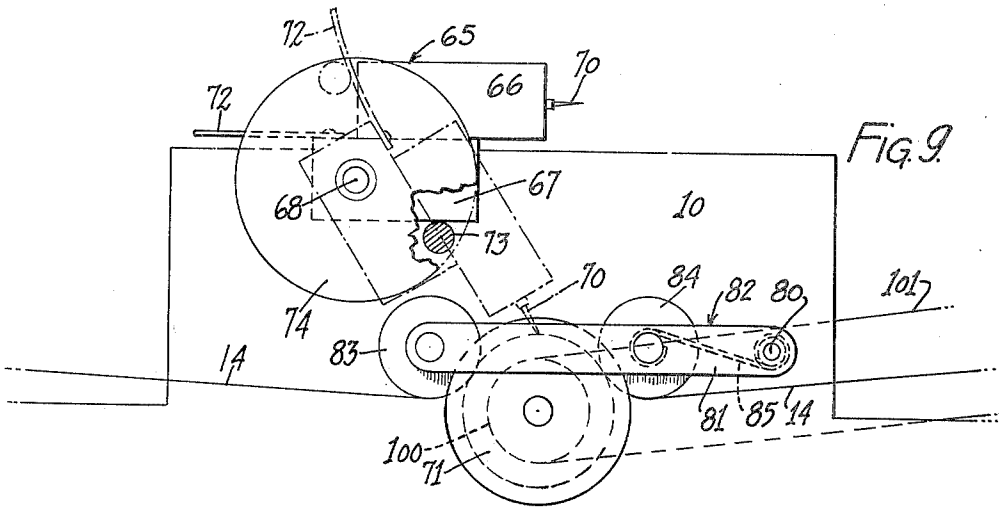


FIG. 9.

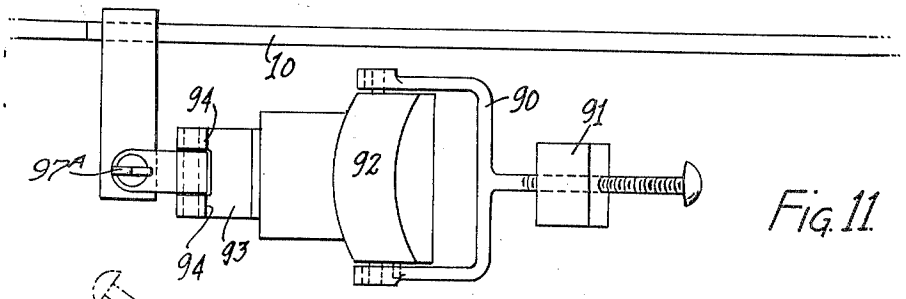


FIG. 11.

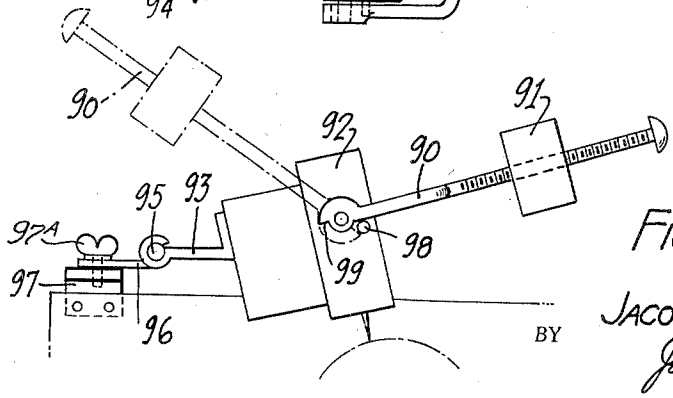


FIG. 12.

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UNITED STATES PATENT OFFICE

2,237,738

SOUND TRANSLATING EQUIPMENT

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Application March 22, 1939, Serial No. 263,365

1 Claim. (Cl. 274—11)

This invention relates to sound translating equipment and in particular to the mounting of sound translating devices as employed in connection with the recording or reproducing of sound.

A particular object of the invention is to provide a novel and simple means for quickly and easily converting the sound unit from reproducing to recording status and vice versa and without the addition or removal of parts.

In the motion picture and sound reproducing, recording and allied arts where voice or sounds are impressed upon an impression receiving surface, it is desirable to have a device that will be effective in handling the tape or film upon which a sound track or plurality of such sound tracks may be impressed or cut. To this end, I have designed a sound translating device which feeds and guides the film or tape; which incorporates means for holding one or more sound translating units for simultaneous or separate operation; which provides for lifting the units off the film for rewind or any other purpose; which provides means for locating the unit at any sound track position for either recording or reproducing; which provides guides which may be rotating or stationary and pressure applying means to the unit.

Still further objects of the invention are the provision of means for weighting the unit or counterweighting the same and adjusting said weight or counterweight so that the pressure on the stylus or needle employed in recording or reproducing may be varied at will; also the use of an impression cylinder being possible, which cylinder is made of acetate or any such molded plastic as is well known at present.

Changes and variations may be made in the constructions shown and described without departing from the principles of the invention or sacrificing the advantages derived from its use; hence such invention is not to be restricted to the precise structure shown in the drawings in which:

Figure 1 is a view in side elevation, showing the mounting of a sound translating unit and the guides employed therein for the film,

Figure 2 is a top plan view of the device as illustrated in Figure 1,

Figure 3 is a fragmentary view of a mounting showing how the unit is mounted for adjustment to pick up a desired sound track or cut a sound track at a desired place laterally of the film,

Figure 4 is a vertical section through the unit and associated parts as shown in Figure 3, the means for moving the unit laterally being shown which may be employed in cutting a plurality of equally spaced sound tracks laterally of the film,

Figure 5 is a modified form of unit mounting provided with a weight for recording,

Figure 6 is a rear view in elevation showing a further form of unit in connection with which an adjustable weight is employed, the latter serving also as a counterweight,

Figure 7 is a view in side elevation of the unit shown in Figure 6,

Figure 8 is a view in perspective showing the cylinder mounting that may be substituted for a roller in the device,

Figure 9 is a side view in elevation of a modified form of the invention in which a film holding bracket is employed providing rollers for engaging the recording roller support,

Figure 10 is a top plan view of the apparatus illustrated in Figure 9,

Figure 11 is a modified form of unit mounting in which the weight is adjustable for use as a counterweight or recording weight, and

Figure 12 is a view in side elevation of the device shown in Figure 11.

Referring to the drawings in detail, **10** indicates a panel upon which are mounted for rotation, the main guide spools **11** and auxiliary guide spools **12**; said spools being mounted for rotation on suitable stud shafts **13** supported on said panel. For convenience of description the member upon which the sound recording or reproducing takes place will be referred to as a film **14**, it being understood that this term applies to any web, tape or film of any material upon which a sound track may be impressed. The film **14** is supported on suitable reels **15** (one only being shown) which may be driven by power or actuated by hand as is well known to cause the film to travel between the reels and over or about the spools. The reels **15** are mounted for rotation in the ends of support arms **16** which may be adjustably secured to the panel in any desired manner. Any of the spools or reels may be power driven and as an instance, the stud **13** that supports the right hand spool is extended behind the panel as at **17** to carry the gear **19** which is actuated by the power driven pinion **20**.

The main spools **11** as well as the spools **12** are flanged as at **18** to confine the film in its passage about the spools and it is tensioned by a roller **21** mounted in one end of an open bracket **22** through which the film passes after it leaves the spool **11**. The bracket is pivoted to the panel by stud **23** so that it can be thrown back to the position shown in outline to release the film and

to take the pressure of the roller 21 off the auxiliary spool. As the film travels over the main spool 11 at the left of the panel it may have a sound track cut therein or sounds from a previously cut track may be translated and in either instance this may be carried out with a single sound unit 25 which consists of the stylus holder 26, the stylus 27 and weight 28 associated with the holder and forming a part of the unit. As seen in Figures 1 and 2, the unit is mounted for pivotal movement on the stud 29 which is supported in a bracket 30 attached to the panel 10. The stylus 27 engages the film 14 at the top of the spool 11 and while only one unit is necessary in Figure 1, it is understood that two may be employed, the other as shown at 31. In this manner, in the use of a film, one unit can be cutting a sound track while the other is reproducing the sound from another track, both units may record or reproduce; the term recording meaning sound track cutting or impressing into the medium to carry the sound track.

In the device it is necessary or preferable to have a means for varying the pressure of the stylus on the film in recording or reproducing and to this end, I employ a pressure lever 32 mounted for pivotal movement on the stud 33 supported on the panel 10. The lever 32 fits frictionally and is held at any adjusted position on stud 33 by set screw 32A. It consists of a finger piece 34 and opposite spring end 35 to which is connected one end of a spring 36 whose other end is attached to the unit 25. The spring end 35 of the pressure lever is arranged to underlie the unit so that, as said lever is actuated by raising the finger end thereof, tension is placed on the spring and the unit stylus presses harder into the film to record a sound track. In playing back, or reproducing the stylus does not press so hard on the film, and the tension of the spring is lessened by pressing down on the finger part of the lever 32 to lift the spring end 35 upwardly and continued pressing down on the finger part of lever 32 will raise the spring end 35 of the lever to contact and raise the unit out of contact with the film. This is done when the film is run back or forward freely for inspection to spot a place in the sound track or to skip over parts or generally run the film without contact of the unit therewith.

As the film may be used for sound alone, it may carry a number of sound tracks at laterally spaced points and in order to accurately place the stylus in any selected sound track or place the sound tracks themselves in original cutting, I employ a unit as shown in Figures 3 and 4 in which the stylus holder is provided with a bracket 38 attached in any manner to the holder 39, the bracket being hollow and holding a nut which rides over a threaded stud 40, the nut 41 being attached to the bracket so that it carries the unit with it as it travels over the screw stud 40 to be positioned laterally with respect to the guide spool carrying the film. The outer or free end of the stud, which is held in arm 42 mounted on panel 10, carries a pinion gear 43 which meshes with a gear 44 on stud shaft 45. The shaft is mounted in panel 10 and also carries in association with the gear 44, the dial 46 and knob 47. The dial indications or marks 48 coincide with a pointer 49 suitably mounted on the panel 10. When the sound track at a certain location is to be used, the unit is first swung up so that the stylus is free of the film, this being permitted by the nut connection to screw 40, after which a turn of the dial to correctly indicated position will permit the stylus to be dropped into the proper sound track. This construction also permits the cutting of a large number of sound tracks spaced laterally of the film. Any of the counterweights and pressure means may be used with this form of unit mounting without changing the scope of the invention.

In the form used in Figure 5, the unit 50 is mounted free with the stud 51 passing through the ordinary solid block member 52 attached to the stylus holder 53. The unit can be thrown back at will to raise the stylus from the film.

In the form of the invention in Figures 6 and 7, the unit 55 is provided with a bracket 56 to which is pivoted the swinging weight 57 mounted for adjustable movement between the screws 58 passing through ears 59 of the bracket 56. The swinging weight therefore serves both as a counterweight and as a cutting weight when recording.

In Figure 8, I have shown a cylinder 60 upon which sound tracks may be impressed, the cylinder being carried on a mandrel 61 that may be mounted on the panel or any suitable supporting means.

In Figures 9 and 10, the unit 65 consists of the holder 66 and weight 67 through the latter of which extends the stud pin 68 upon which the unit is free to swing to position the stylus 70, on the film 14 which travels over a flanged roller 71. The unit has secured thereto a protruding leaf spring 72 which is arranged to be engaged by a pin 73 carried on a disc 74 mounted on stud shaft 75. As the unit is to impress a sound track or record sound on the film, the disc 74 is turned until the pin 75 bears with pressure against the spring which in turn bears the unit against the film with force. If the reproduction is desired, the disc is moved to disengage the pin from the spring and the only pressure on the unit stylus will be that supplied by the weight 67. If the unit is to be raised to free the stylus from the film the disc is revolved to position the pin against the unit and revolve it to the outline position in Figure 9.

In order to assist in keeping the film tightly wound on the upper surface of the roller 71, I provide a fixed stud 80 in panel 10 about which may swing the arms 81 of a roller bracket 82 between which are journalled rollers 83 and 84 which engage the roller 71 at substantially opposite sides thereof, both rollers 83 and 84 fitting snugly into the seated portion of the flanged roller 71 to hold the film securely in place about the roller as the latter revolves to feed the film past the stylus. The roller bracket 82 is spring pressed toward the roller 71 by the leaf spring 85.

In Figures 11 and 12, I have shown a mounting for a sound unit that embodies an adjustable swinging weight consisting of the yoke arm 90 threaded to receive the threaded weight 91 which is adjustable lengthwise of said arm 90, the latter in its lower yoked end being pivoted to opposite sides of the unit 92. The unit is provided with a rearwardly extending bracket 93 whose ears 94 engage pivotally with the pin 95 carried by one end of the tongue 96 which is adjustably attached to a support bracket 97 on the panel 10 by a wing and nut connection 97A. When it is desired to cut a sound track in the film 14, the weight may be adjusted toward or away from the unit as shown in full lines in Figure 12, the forward swing of the arm being limited by the

pin 98 in the unit. This places an adjustable pressure on the stylus. When the play back or recording is desired, the arm is swung to the outline position of Figure 12, its movement being again limited by the pin 98 engaging the notch 99 of the arm. Movement of the weight also varies the pressure on the stylus and when the unit is to be removed from the film, it is swung back about the pin 95. The wing nut 97A is loosened when it is desired to swing the unit laterally to any position at which a sound track is located on the film.

In Figures 9 and 10 means are shown as at 100 for driving the roller 71 in synchronism with a reel through the medium of the belt 101.

I claim:

In a sound translating equipment, in combination, a unit for reproducing or recording sound including a stylus mounted for pivotal movement away from and to contact with an impression medium, adjustable means associated with the unit for applying various degrees of stylus pressure on said medium, means for moving the unit laterally of the impression medium to coincide with selected sound track locations on said medium, including a revolvable threaded stud, a nut on the stud and a bracket on the unit in which said nut is positioned, a movable dial indicator for showing said sound track locations and means for transmitting movements of the dial indicator to the stud as said dial indicator is adjusted to position said unit.

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