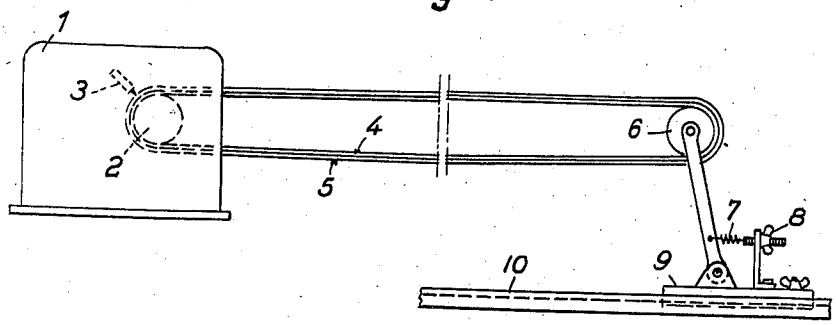
Feb. 24, 1942. H. WESTERKAMP 2,273,916

INSTALLATION FOR MECHANICALLY RECORDING SOUND ON ENDLESS TAPES COATED WITH WAX

Filed July 8, 1939

Fig.1.



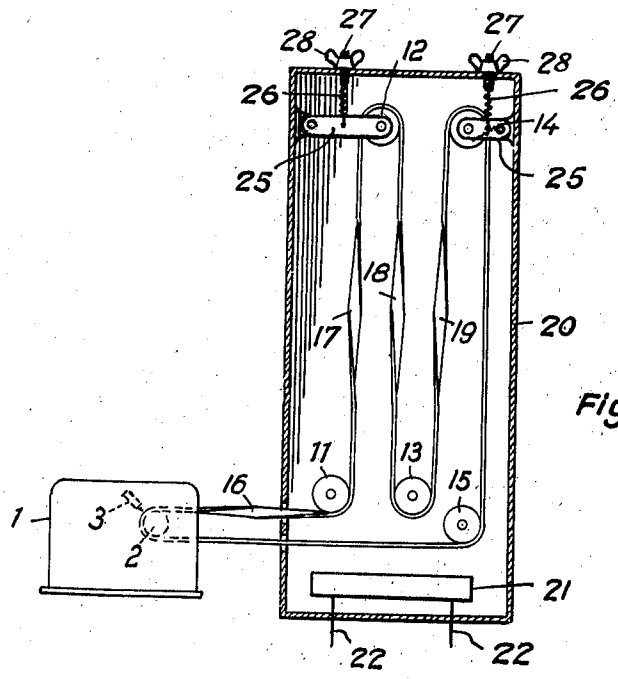


Fig.2.

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INSTALLATION FOR MECHANICALLY RECORDING SOUND ON ENDLESS TAPES COATED WITH WAX

Hugo Westerkamp, Cologne-Braunsfeld, Germany

Application July 8, 1939, Serial No. 283,489
In Germany August 13, 1938

1 Claim. (Cl. 274—11)

The invention relates to the mechanical recording of sound on endless tapes coated with wax. The sound tapes, which consist of a carrier of tape form and a thin layer of wax composition particularly suitable for sound recording uniformly applied thereto, are passed through a sound-recording apparatus having a stylus for cutting sound tracks into the layer of wax.

The layer of wax must not come into contact with any other objects, particularly after the sound track has been cut therein, since the slightest additional deformation of the layer of wax impairs the sound recording. Quite apart from this, the sound tape must be withheld from any external influences, because the wax layer is inclined to crack off from its carrier readily and if only one fragment of the wax layer is cracked off the entire record tape is rendered useless. The difficulty in handling the sound tape during the recording is further increased by the fact that sound tapes are generally of very great length, which may amount to 100 m. and more in the case of lengthy sound recordings.

In the production of mechanical sound records on unwaxed tapes, for example on tapes provided with a layer of gelatine, the endless tape lies as a roll with a drawn-out loop on a power-driven or friction-driven plate. It has been found impossible to arrange waxed sound tapes in the same or a similar manner in the sound-recording apparatus for the reasons mentioned in the foregoing, since friction between the wax layer of the sound tape and the carrier of tape is unavoidable, not only at the entrance of the tape into the roll, but also in the roll itself.

In order to overcome this difficulty in handling the sound tape, it is proposed in accordance with the invention to pass the endless sound tape outside the sound-recording apparatus in loops about a plurality of tension rollers and, if desired, to twist it through 180° between the sound-recording point and the tension rollers adjacent thereto.

The tension rollers and that part of the sound tape extending outside the sound-recording apparatus are preferably enclosed in a heatable chamber, the heat of which brings the wax composition of the sound tape to a degree of softness which is desirable for the sound recording.

The drawing shows diagrammatically two constructional examples of an installation for recording sound according to the invention.

In Figure 1, 1 is the sound-recording apparatus with the roller 2 over which the tape passes during the cutting of the sound track by the stylus 3. The sound tape, which consists of the carrier 4 of tape form and the wax layer 5, passes inside the recording apparatus only as far as is essential. The entire remaining part of the sound tape extends out of the recording apparatus and passes over a tension roller 6, the tension exerted by which is adjustable by means of the spring 7 and the adjustment screw 8 and which is secured pivotally to a slide 9 for the purpose of adaptation to the momentary length of the sound tape, the said slide being adapted to be displaced and held fast on a guide 10.

In the installation shown in Figure 2, a plurality of tension rollers 11, 12, 13, 14 and 15 are provided which are also adjustable for the purpose of adaptation to the length of the sound tape and the tension exerted by which can be regulated. The adjustable tension means is shown in Figure 2 as comprising the lever arms 25 for supporting the tension rollers 12, 14, and being connected by springs 26 to the threaded members 27 which may be adjusted in position by the wing nuts 28 whereby to vary the tensional pull exerted through the levers 25 upon the successive flights of the tape. The sound tape, which passes from the sound-recording point to the tension roller 11 situated outside the recording apparatus, has at 16 a turning point in order that the carrier, and not the engraveable wax layer upon it, may come into contact with the surface of the tension roller 11. Corresponding turning points of the sound tape are provided at 17 between the tension rollers 11 and 12, at 18 between the clamping rollers 12 and 13 and at 19 between the clamping rollers 13 and 14, which are all situated outside the recording apparatus. From the tension roller 14, the sound tape passes, without turning, over the tension roller 15 and back to the sound-recording point. The arrangement provides for supporting the tape in a zigzag manner at turning points which are spaced apart, while the tape is being held under tension to prevent any accidental movements which would cause one flight of the tape to contact with another flight; and by having the successive twists between supporting points, the tape always encounters the rollers which provide these supporting points at its carrier side, and the wax face is protected against contact throughout.

The tension rollers and the sound tape extending outside the sound-recording apparatus are enclosed by a casting 20 surrounding a chamber adapted to be heated by a heater 21 supplied

with a heating medium through the connections 22, the heat of which brings the wax composition of the sound tape to a temperature at which the stylus 3 effects the best cutting, and maintains the wax composition at this temperature.

The invention is not limited to the constructional examples described and illustrated, but numerous modifications may be made in the installation without departing from the invention. Thus, for example, in an installation as shown in Figure 2, it is not essential that all the rollers disposed outside the recording apparatus, over which the sound tape is passed, should be constructed as tension rollers. It is sufficient for one or a few of these rollers to be tension rollers.

I claim:

The method of recording sound upon a long endless tape having a carrier backing coated at one face with wax by cutting a sound track in the wax coating, which comprises supporting the major portion of the endless tape in the form of loops passing in zigzag fashion about spaced turning points, said tape being twisted between consecutive turning points through 180 degrees about its longitudinal axis so that only the carrier backing contacts the supports and the wax coating is protected against contact, and maintaining the tape substantially throughout its length at a predetermined temperature for the optimum condition of the wax for the zigzag and twisting movement of the tape and for cutting the sound track, and during the passage of the tape from the cutting point through its zigzag and twisted course and back to the cutting point.

HUGO WESTERKAMP.