

Sept. 29, 1942.

F. PÖHLMANN

2,297,242

SOUND RECORDING AND REPRODUCING MACHINE

Filed Dec. 24, 1937

2 Sheets-Sheet 1

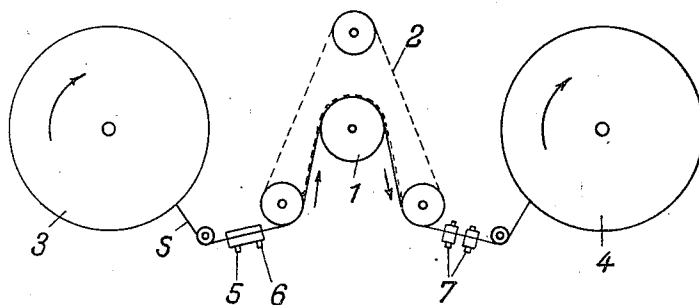


Fig. 1

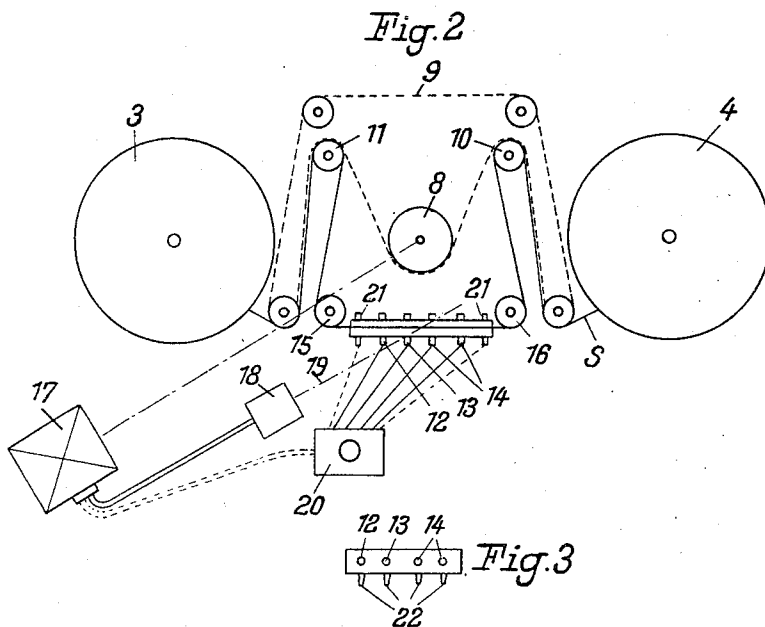


Fig. 2

Fig. 3

Inventor:

Fritz Pöhlmann

by R.C. Haggood  
Att'y

Sept. 29, 1942.

F. PÖHLMANN

2,297,242

SOUND RECORDING AND REPRODUCING MACHINE

Filed Dec. 24, 1937

2 Sheets-Sheet 2

FIG. 4.

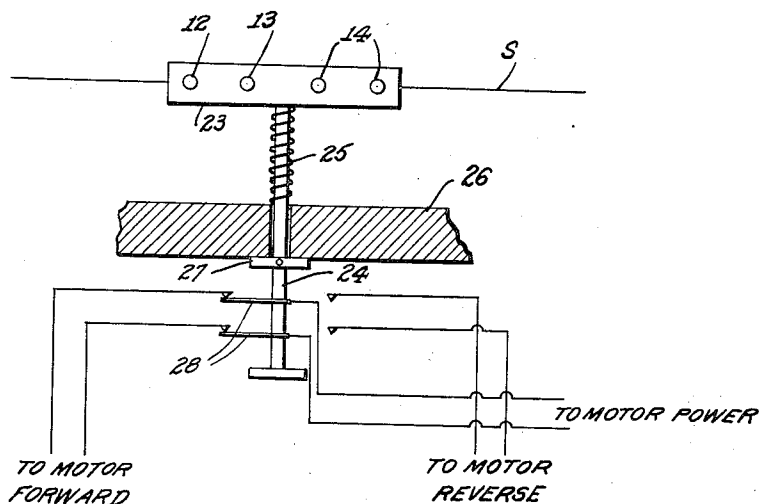
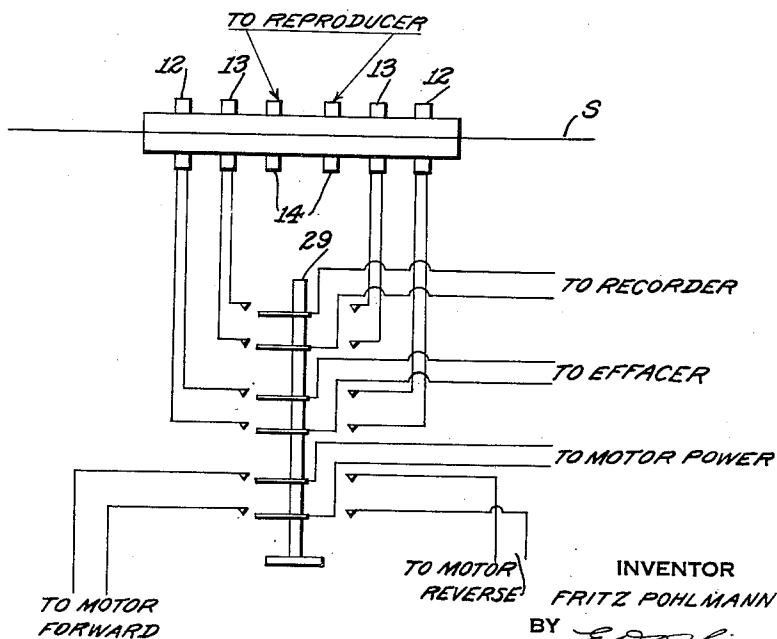


FIG. 5.



INVENTOR  
FRITZ PÖHLMANN  
BY *Edo Hinney*  
ATTORNEY

## UNITED STATES PATENT OFFICE

2,297,242

SOUND RECORDING AND REPRODUCING  
MACHINEFritz Pöhlmann, Allach, near Munich, Germany;  
vested in the Alien Property CustodianApplication December 24, 1937, Serial No. 181,673  
In Germany December 24, 1936

1 Claim. (Cl. 179—100.2)

The present invention relates to electromagnetic sound recording and reproducing machines.

The known apparatus for recording and reproducing sound involve the disadvantage that a record bearing body which still carries previously impressed records is capable to receive further records merely in cases of being advanced in a particular direction, due to the fact that the obliterating head and the recording head must be provided in tandem with respect to the moving direction of the record bearing medium. For instance, cases may occur in which a sound carrying medium just recorded, or the record of which has just been reproduced, must immediately be ready for operation, and that no time is available for back-winding or interchanging this medium.

The present invention has for its object to avoid the objectionable back-winding of the record carrier between the reproduction and a new recording procedure. The problem is thus to be solved how to effect record effacing, re-recording and reproduction of sound in the momentarily most suitable moving direction of the sound carrier.

According to the invention, mechanical or electrical switches are provided and adapted to connect the different heads in order to obtain a correct succession with respect to the effacing, the recording and the reproduction regardless whether the record carrier is advanced in the one or other direction. These switches may be mechanically coupled to the switch which controls the direction of rotation of the driving motor, so as to compulsorily cause the heads to be connected in the proper sequence, when the direction of rotation of said motor is reversed.

The invention will be more readily understood from the following description taken in conjunction with the attached drawings in which:

Fig. 1 by way of comparison schematically illustrates a partial arrangement of a known machine for recording and reproducing sound; while Fig. 2 schematically shows one embodiment of the inventive idea as applied to such machines.

Fig. 3 illustrates the use of plugs attached to the body of a head assembly for ease in reversing the head assembly by hand.

Fig. 4 shows a type of mechanical switch for reversing a head assembly.

Fig. 5 shows an electrical switch for reversing the sequence of operations performed on a moving tape.

The known arrangement illustrated in Fig. 1 comprises a pulley 1 which is adapted to drive an

endless fibre belt 2, which in turn advances the sound carrier which may be a steel wire or tape, for example. Two spools or reels 3 and 4 serve as support for the record carrier in a well known manner. Reference numeral 5 indicates an obliterating head, 6 a recording head and 7 a reproducing set of heads. The wire or tape S is moved in the direction indicated by the arrows, regardless whether a record is to be made or if a record is to be reproduced. For instance, in cases that almost the entire recorded tape has been wound up on the spool 4, a back-winding thereof to the spool 3 is necessarily required before the reproduction of this record or records can be commenced. This means a considerable loss of time which can be rather severe, for instance in cases of urgent reports.

This drawback is obviated according to the present invention as illustrated in Fig. 2. The pulley 8 drives the endless fibre belt 9 over the pulleys 10 and 11, which in turn advance the record carrying body S which may be a wire or tape of steel, for instance. The effacing head 12, the recording head 13, and the reproducing set of heads 14 are assembled on a support common thereto which is provided between the two pulleys 15 and 16. The drawings show the condition which exists when the record carrier is advanced through the head assembly from west to east, when the machine is prepared to receive a record or to reproduce a record previously made. If the moving direction of the record carrier is to be reversed, also the assembly of heads must be rotated over 180° with respect to the record carrier. This may, for instance, be achieved either by turning the assembly 12, 13, 14 about an axis 19 perpendicular with respect to the plane of the drawing, or by fixing the housing of the assembly 12, 13, 14 by means of plugs 22 in a frontal plate, whereby the assembly is brought in its new position by means of reversing the plugs. This plug arrangement is illustrated in Fig. 3. A further possibility consists in the provision of spare heads 21 which, for instance, may be positioned in the same housing and which may be selectively connected in accordance with the direction of the record carrier, e. g., the tape S by the agency of an electrical switch 20. These spare heads may also be provided in another position than that shown in Fig. 2. The changeover switch, e. g., the mechanical switch 18 or the electrical switch 20, may be coupled with the motor switch so that the heads are compulsorily connected in the correct sequence when the rotation of the motor 17 is reversed.

An example of a mechanical switch for reversing a head assembly is shown in Fig. 4. The assembly 23 is open on the side opposite the point of connection of shaft 24. The spring 25 and the mounting 26 hold the shaft in position and the assembly steady. The collar 27 is pinned to the shaft 24 and may be adjusted to change the position of the assembly 23 with respect to the tape S. Switch blades 28 attached to the shaft 24 control the direction of motor rotation. To reverse the head assembly, the assembly is withdrawn from the tape S by means of shaft 24, the shaft is rotated through 180 degrees, thereby rotating the assembly through 180 degrees, and then the shaft is pushed forward thus placing the heads 12-14 in contact with the tape with the heads in reverse order. Simultaneously, the direction of motor rotation is reversed by the switch blades 28 and the apparatus is ready for a new cycle of operation with the recording tape moving in the opposite direction.

A substitute for the mechanical switch is shown in the electrical switch of Fig. 5. In this case, two spare heads must be provided, a reproducing head and an effacing head. This arrangement, however, eliminates the changing of the position of the head assembly. When the tape S is traveling from left to right, the right hand heads 12 and 13 are electrically disconnected and the left hand heads 12 and 13 are electrically connected by means of the gang switch 29. Similarly, if it is desired to move the tape in the opposite direction, the switch is turned to reverse the motor and at the same time the left hand heads are disconnected and the right hand heads connected.

The arrangement according to the invention as illustrated in Fig. 2 involves a further advantage. Experience teaches that the known arrangement which is shown in Fig. 1 introduces

the disadvantage that the reproducing heads 7 are positioned behind the constant drive 1 which effects the advancement of the record bearing body S. The result of this arrangement is that a "whining" noise affects the reproduction due to a certain lack of uniformity with respect to the pull of the receiving spool or reel 4, which is in turn caused by irregular operation of the sliding frictional coupling which controls the drive or pull of said spool. According to the invention, however, the portion of the record carrying body which influences the reproducing heads is withdrawn from the action of the receiving spool or reel, so that the undesired "whining" is eliminated.

Although the present invention is described and demonstrated in conjunction with a sound reproducing and recording machine employing a steel tape as record bearing body, the inventive idea is applicable also to special machines of the aforesaid type, e. g. dictaphones.

What is claimed is:

In a sound recording and reproducing machine, two revolubly mounted reels adapted to carry a record bearing body, means for advancing said body in either direction, a rotary support, an obliterating head, a recording head and a reproducing head mounted on said support adjacent to said record bearing body, switching means controlling the direction of the advancing of said body coupled to said rotary support, manually operated means for operating said switching means to advance said body in the desired direction, said manually operated means being effective to rotate said support so that the heads mounted thereon are always effective on said record bearing body in the same sequence irrespective of the direction of movement of said body.

FRITZ PÖHLMANN.