July 13, 1954 W. C. FOSTER 2,683,605

SOUND RECORDING ADAPTER

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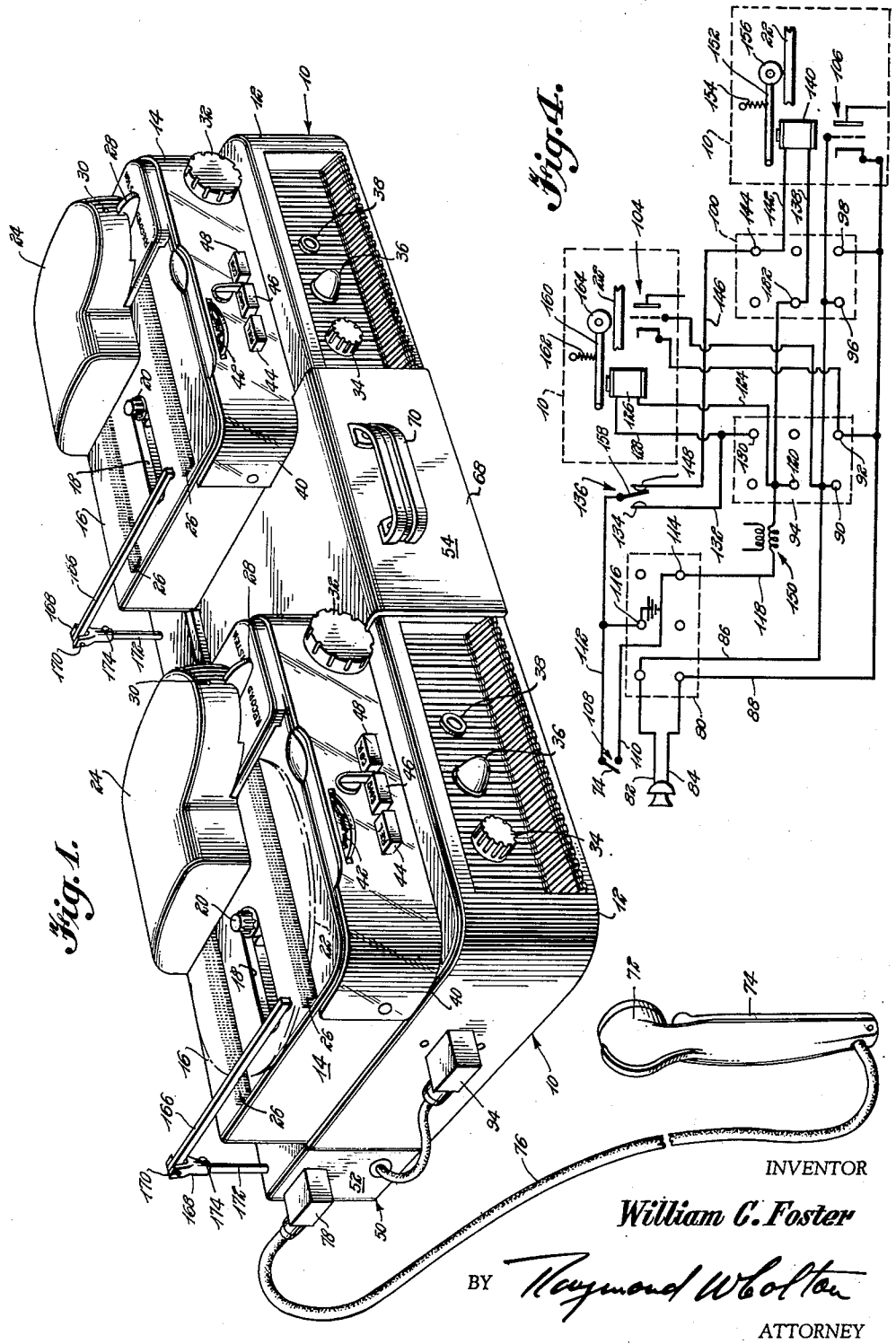


Fig. 1.

Fig. 4.

INVENTOR

William C. Foster

BY Raymond W. Colton

ATTORNEY

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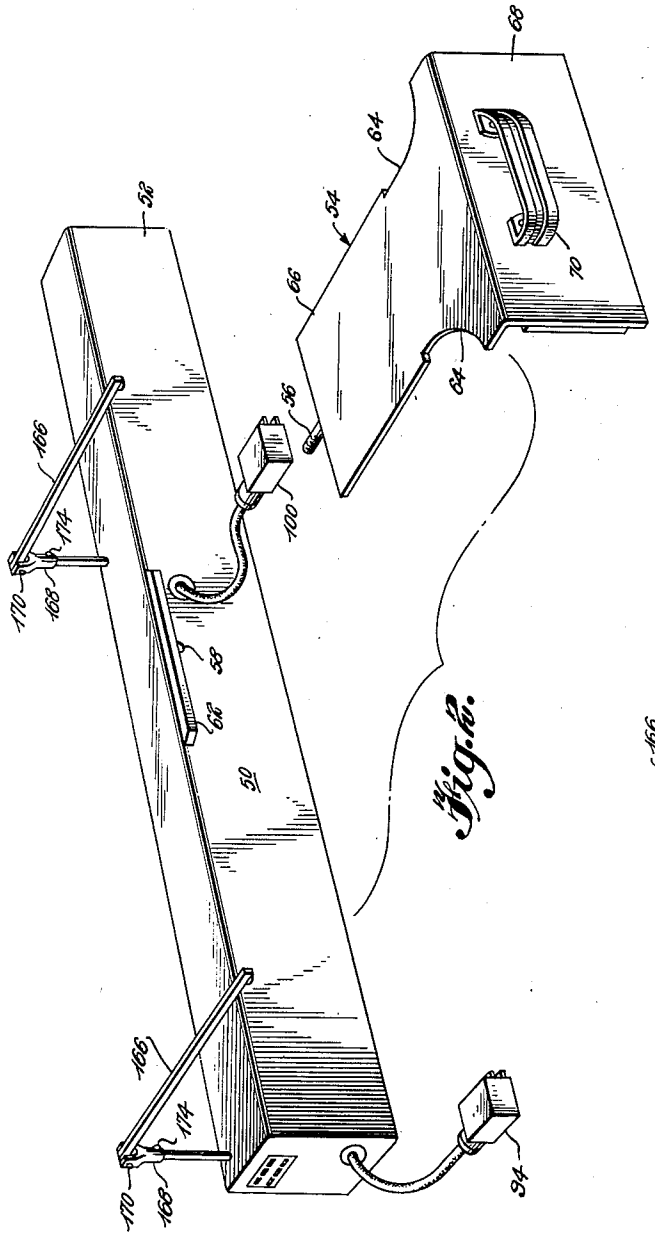


Fig. 2.

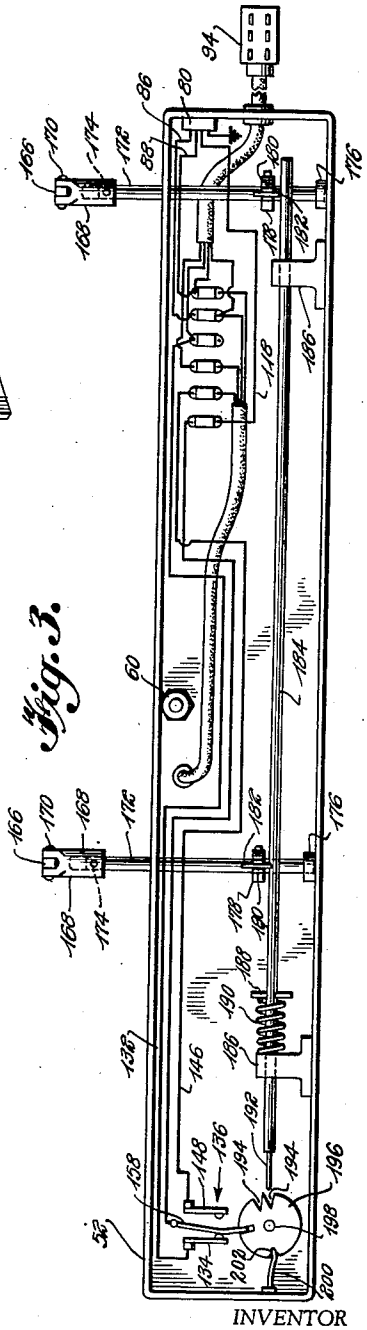


Fig. 3.

INVENTOR

William C. Foster

BY Raymond Wolfe

ATTORNEY

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SOUND RECORDING ADAPTER

William C. Foster, Baltimore, Md., assignor to The Gray Manufacturing Company, a corporation of Connecticut

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10 Claims. (Cl. 274—10)

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Uninterrupted recording of sound has been achieved commercially with many types of apparatus, but each of them has until now required machines especially designed for the purpose as distinguished from standard sound recording machines used in multiples by means of an adaptor.

In accordance with the present invention, the need for such special machines has been obviated by an adaptor which can be positioned with respect to two or more machines of standard types so that when one of them which is recording approaches a point at which its record will become completely used, a second of the machines will be placed in operation to continue the recording, and if desired, an overlapping condition can be produced so that a portion of the intelligence will be recorded on each of the records as is common in the art.

The adaptor contemplated by the present invention is intended for combination with a plurality of independent sound recording machines each of which has means for initiating a recording operation and each of which has a relatively movable recording head member and a record support member. The adaptor comprises a frame, positioning means carried by the frame engageable with the machines for mutually locating the adaptor and machines, actuating elements movably carried by the frame for interposition in the paths of movement of the members, selecting means carried by the frame for sequentially activating the recording initiating means of the machines, and operating means interconnecting the actuating elements and selecting means. The machines in conjunction with which the invention has been illustrated contemplate a movable record carriage, and the adaptor preferably utilizes actuating elements which are pivotally carried by the adaptor frame for interposition in the paths of movement of such record carriage or support members. The sound recording machines illustrated are provided with electrical means for initiating a recording operation, and the adaptor provides electrical switching means carried by its frame for sequentially activating the recording initiating means of the machines, there being conductors carried by the frame for connecting the switching means and recording initiating means.

The sound recording machines described herein have record driving means which are sequentially activated by the selecting means carried by the adaptor frame. These sound recording machines likewise have starting switches together

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with a stylus member and record carriage member in each case, the adaptor providing actuating arms pivotally carried by its frame for interposition in the paths of movement of the members, a selecting switch for sequentially energizing the starting switches of the machines, and a mechanical movement interconnecting the actuating elements and selecting switch.

Each of the sound recording machines has record driving means and input terminals, and selecting means carried by the frame for sequentially activating the driving means is provided together with conductors carried by the frame for connection with the input terminals. The recording head member and record support member of each machine are relatively movable through a predetermined path and the actuating elements movably carried by the frame are interposed in the terminal portions of these paths of movement to impart movement to an operating means for operation of the selecting switch. Inasmuch as a practical embodiment of this invention would involve two sound recording machines, the selecting switch carried by the adaptor would in that case, have two poles for alternately activating the recording initiating means of the two machines. The strokes of the actuating elements are preferably rendered adjustable so that a recording operation can be shifted from one machine to another for any desired departure of the relatively movable members of either machine.

The adaptor likewise serves the function of clamping two or more machines together physically so that they can be handled as a unit.

A more complete understanding of the invention will follow from a detailed description of the accompanying drawings wherein:

Fig. 1 is a perspective view depicting the adaptor of the present invention combined with a pair of standard sound recording machines;

Fig. 2 is an exploded perspective view of the adaptor;

Fig. 3 is a rear elevation of the adaptor with its rear cover removed; and

Fig. 4 is a schematic circuit diagram depicting the manner in which the adaptor is electrically connected with a pair of machines of the type shown in Fig. 1.

Each of the machines 10, depicted in Fig. 1, is an independent sound recording and reproducing machine commercially available from The Gray Manufacturing Company, Hartford 1, Connecticut, sold under the trade-mark "Audograph." Each of the machines comprises a lower

frame member 12 and an upper frame member 14 provided with suitable hinges and latching means, not shown, so that the upper frame member can be elevated for access to the working parts housed within the two frame members. Each of the upper frame members provides a table 16 containing an elongated slot 18 through which a splined spindle 20 projects to receive the complementary opening of a disc record 22. The spindle is rotatably mounted in a carriage which traverses the slot 18 to advance the record relative to its stylus which is located beneath the cover 24. Each of the tables 16 is grooved to receive a pair of plush strips 26 arranged substantially parallel to the length of the slot 18 and serving to support the record 22 out of contact with the table 16. A control lever 28, shown in its neutral position in the case of each machine in Fig. 1, can be shifted to the left to move a recording stylus beneath the cover 24 into contact with the record 22, and movement of the lever 28 to the right will move a reproducing stylus beneath the cover 24 into contact with the record 22. In either of its operative positions, marked "Record" and "Listen" on the machines, the control lever 28 moves a driving roller into operative engagement with the record to effect its rotation. As the record rotates under whichever stylus is effective at the moment, the spindle 20 imparts rectilinear movement to the record carriage towards the left as viewed in Fig. 1. A jewel 30 carried by the housing cover 24 above the control lever 28 indicates the operating condition of the apparatus. The position of the carriage and its spindle 20 can be manually adjusted by turning the knob 32 provided at the right end of each upper frame member 14. A knob 34 actuates a combined switch and reproduction volume control, an indicator lamp 36 provides a visual indication of the sound input to the amplifier, and a jack 38 permits the ready connection of external phones or a speaker. A transparent guide 40 serves as a retainer for an index strip, not shown, such a strip being driven by means of a sprocket 42 whose movements are a function of those of the record carriage. At the front of each of these guides, there are three keys including a release key 44 which serves to retract the sprocket 42 for insertion and removal of an index strip, an end key 46 for actuating a punch which codes the index strip, and a correction key 48 which actuates another punch for differently coding the index strip.

The adaptor 50 includes a frame 52 and a clamping member 54 which are assembled by inserting the screw 56 carried by the clamping member through an opening 58 formed through the frame and applying a nut 60 to maintain the parts in unitary relationship. The forward surface of the frame 52 as depicted in Fig. 2 engages the rear surfaces of the two sound recording machines 10, a spacing member 62 carried by the upper portion of this surface spacing the rear portions of the two machines. The clamping member is provided with arcuate portions 64 which complement correspondingly curved portions of the machines to effect a clamping action. The clamping member has an upper wall 66 which assumes a horizontal position in its assembled relationship, and an integral front wall 68 which is vertically arranged when assembled with the machines. This front wall is provided with a handle 70 which can be used to transport the entire assembly, including the two machines, as a unit.

As illustrated in Fig. 1, a microphone 72 carrying a switch arm 74 is connected through a cable 76 and plug 78 with a receptacle 80, depicted in Fig. 3. Two conductors within the cable 76 carrying the microphone current are represented in Fig. 4 as conductors 82 and 84. These conductors are connected respectively with conductors 86 and 88 at the receptacle 80, and with terminals 90 and 92 of a plug 94 and corresponding terminals 96 and 98 of a plug 100. The plug 94 is received in the receptacle of the left hand machine 10, connecting its terminals 90 and 92 with the input tube 104 as diagrammatically depicted in Fig. 4. In a similar way, the plug 100 is received in a corresponding receptacle of the right hand machine of Fig. 1, so that the terminals 96 and 98 will be applied to the elements of the amplifier input tube 106 of this right hand machine.

The cable 76 also includes conductors extending from the terminals of the microphone switch 108, these conductors, 110 and 112 being connected to the terminals 114 and 116 respectively, of the receptacle 80. A conductor 118 extending from the terminal 114 is connected with a terminal 120 of the plug 94 and a corresponding terminal 122 of the plug 100. The terminal 120 is connected through a lead 124 with one end of the winding of a solenoid 126, the other end being connected through a lead 128 with a terminal 130 of the plug 94, this terminal being connected through a lead 132 with one of the poles 134 of a selecting switch 136. The terminal 122 of the plug 100 is connected through a lead 138 with one end of the winding of a solenoid 140 whose other end is connected by means of a lead 142 with a terminal 144 of the plug 100. This terminal 144 is connected through a lead 146 with the other pole 148 of the selecting switch 136. A source of current has been depicted as a transformer 150 introduced into the conductor 118 for energizing the solenoids 126 and 140 in the order of their selection by the switch 136. Obviously, the current supply can be direct or rectified and introduced at any appropriate portion of the circuit.

With the switch 136 in the position depicted in Fig. 4 of the drawings, and the microphone switch 74 closed, the solenoid 140 will be energized and its armature 152 will move downwardly against the force of the retracting spring 154 to move a roller 156 into contact with the record 22 to drive the same and through it, its carriage as already described. When the switch 136 assumes its other position, wherein the arm 158 is in contact with the pole 134, the solenoid 126 will be energized to attract its armature 160 downwardly against the force of the retracting spring 162 to engage the roller 164 with the record 22 to rotate it and through it effect feeding movement of its carriage.

As the carriage of the operating machine moves towards the left, as viewed in Fig. 1, the spindle 20 will travel to the left and as it approaches the end of its travel, will engage an actuating element 166 imposed in its path, tending to move the actuating element clockwise as viewed in Fig. 1, thereby rotating its yoke 168 in which it is mounted by means of a pivot 170, and correspondingly rotate the vertical shaft 172 to which the yoke is secured by means of a set screw 174. The shaft 172 is journalled in an opening formed in the top wall of the frame member and in a bearing 176 secured to the lower wall of the frame member. Each of the shafts

172 has a collar 178 suitably secured thereto, each of the collars carrying an arm 180 in which a slot is formed for the reception of a pin 182 carried by a horizontal rod 184 which is received in guides 186 for reciprocatory movement. The rod 184 carries an abutment 188 between which and one of the guides 186, a spring 190 is interposed to bias the rod towards the right as viewed in Fig. 3. At the left end of the rod 184, a resilient finger 192 is suitably secured for reception in one of the openings 194 formed in an oscillatory member 196 pivotally mounted on a pin 198. A leaf spring 200 mounted on the frame 52 has its free end received in a notch 202 diametrically opposed to the median portion of the notches 194. Disposed at an angle of 90° to the notch 202, the oscillatory member 196 carries the switch arm 158 which selectively contacts the poles of the switch 136.

Thus it will be clear that as the record carriage of the operative machine approaches the end of its path, the corresponding actuating arm 166 will be moved outwardly to rotate its vertical shaft 172, movement of which will be transmitted to the corresponding pin 182 carried by the rod 184 which will move to the left as depicted in Fig. 3, so that the resilient finger 192 will enter the notch 194 which is opposed thereto, the lower notch being so disposed as illustrated in Fig. 3, whereupon the oscillatory member 196 will be moved clockwise from the position depicted and as the leaf spring 200 travels over its center, the upper notch 194 will be moved downwardly to receive the resilient finger 192 the next time the rod 184 is reciprocated. As the oscillatory member 196 moves clockwise, it will move the switch arm 158 from its contact with the pole as shown in Fig. 3, into contact with the other pole of the switch 136. Thus, the machines will be consecutively energized by this adaptor so that when one of the machines has its record filled, the other machine begins its recording operation, giving an operator ample time to remove the filled record and replace it by a blank ready to receive intelligence when next called upon by the automatic arrangement just described.

By loosening the set screws 174, the actuating members 166 can be adjusted with respect to their shafts 172 to produce any desired degree of overlap or to accommodate records of various sizes. It will be understood of course, that the sound recording machines will be properly energized from suitable current sources to effect the necessary drive and to render the amplifiers and other components of the machines operative, just as is the case where the machines illustrated herein are used independently of one another.

When a completely used record has been removed from a machine and replaced by a blank, the carriage of that machine will be shifted to the right as viewed in Fig. 1, followed by the actuating arms 166 under the force of the spring 190.

Whereas this invention has been depicted in connection with a particular type of sound recording machine, it will be clear to those skilled in the art that it is applicable to other types of machines already known in the trade and accordingly, the invention should not be restricted to use in conjunction with any particular make of machine or to any specific details of construction beyond the scope of the appended claims.

I claim:

1. For combination with a plurality of independent self contained sound recording machines each having a driving motor, each having means for initiating a recording operation and each having a relatively movable recording head member and record support member; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating elements movably carried by said frame for interposition in the paths of movement of said members, selecting means carried by said frame for sequentially activating the recording initiating means of said machines, and operating means interconnecting said actuating elements and selecting means.

2. For combination with a plurality of independent self contained sound recording machines each having a driving motor, each having means for initiating a recording operation and each having a recording head member and a relatively movable record support member; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating elements pivotally carried by said frame for interposition in the paths of movement of said record support members, selecting means carried by said frame for sequentially activating the recording initiating means of said machines, and operating means mechanically interconnecting said actuating elements and selecting means.

3. For combination with a plurality of independent self contained sound recording machines each having a driving motor, each having electrical means for initiating a recording operation and each having a relatively movable recording head member and record support member; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating elements movably carried by said frame for interposition in the paths of movement of said members, electrical switching means carried by said frame for sequentially activating the recording initiating means of said machines, conductors carried by said frame for connecting said switching means and recording initiating means, and operating means interconnecting said actuating elements and selecting means.

4. For combination with a plurality of independent self contained sound recording machines each having a record driving motor and each having a relatively movable recording head member and record support member; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating elements movably carried by said frame for interposition in the paths of movement of said members, selecting means carried by said frame for sequentially

activating said record driving motors, and operating means interconnecting said actuating elements and selecting means.

5. For combination with a plurality of independent self contained sound recording machines each having a driving motor, each having a starting switch and each having a relatively movable stylus member and record carriage member; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating arms pivotally carried by said frame for interposition in the paths of movement of said members, a selecting switch carried by said frame for sequentially energizing the starting switches of said machines, and a mechanical movement interconnecting said actuating elements and selecting switch.

6. For combination with a plurality of independent self contained sound recording machines each having a record driving motor and input terminals and each having a relatively movable recording head member and record support member; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating elements movably carried by said frame for interposition in the paths of movement of said members, selecting means carried by said frame for sequentially activating said driving motors, conductors carried by said frame for connection with said input terminals, and operating means interconnecting said actuating elements and selecting means.

7. For combination with a plurality of independent self contained sound recording machines each having a driving motor, each having a switch for initiating a recording operation and each having a recording head member and record support member relatively movable through a predetermined path; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating elements movably carried by said frame for interposition in the terminal portions of the paths of movement of said members, a selecting switch carried by said frame for sequentially activating the recording initiating switches of said machines, and operating means transmitting movement of said actuating elements to said selecting switch.

8. For combination with a pair of independent self contained sound recording machines each having a driving motor, each having means for initiating a recording operation and each having a relatively movable recording head member and record support member; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating elements movably carried by said frame for interposition in the paths of movement of said members, a selecting switch having two poles carried by said frame for alternately activating the recording initiating means of said machines, and operating means interconnecting said actuating elements and selecting switch.

9. For combination with a pair of independent self contained sound recording machines each having a driving motor, each having means for initiating a recording operation and each having a relatively movable recording head member and record support member; an adaptor comprising a frame separably engageable with a surface of each of said machines, positioning means carried by said frame engageable with said machines for mutually locating said adaptor and machines, clamping means adjustably carried by said frame for separably securing said frame and machines together as a unit, actuating elements movably carried by said frame for interposition in the paths of movement of said members, means for adjusting the strokes of said actuating elements, selecting means carried by said frame for alternately activating the recording initiating means of said machines, and operating means transmitting terminal movements of said actuating elements to said selecting means.

10. For combination with a plurality of independent self contained sound recording machines each having a driving motor, each having means for initiating a recording operation and each having a relatively movable recording head member and record support member; an adaptor comprising a frame, clamping means carried by said frame engageable with said machines for mutually locating said adaptor and machines and securing them together as a unit, a carrying handle secured to said frame for transporting such unit, actuating elements movably carried by said frame for interposition in the paths of movement of said members, selecting means carried by said frame for sequentially activating the recording initiating means of said machines, and operating means interconnecting said actuating elements and selecting means.

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