CONTROL MECHANISM FOR TAPE PLAYERS AND THE LIKE
6 Claims, 4 Drawing Figs.

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ABSTRACT: Pause and rewind controls for tape apparatus such as tape recorders and reproducers. In the housing of the illustrated player a gear member is journaled at one end of a movable link, with part of the gear projecting from a sidewall of the housing to provide a thumb wheel. Manual pressure on this thumb wheel pivots the link, against a spring force, and engages the wheel or gear with a pinion, and thereby with a tape reel in the housing. The arrangement is such that by such engagement, the reel and tape are caused to stop. In addition, the thumb wheel can be rotated manually in one direction, so that said pinion causes rewinding of the tape.
CONTROL MECHANISM FOR TAPE PLAYERS AND THE LIKE

BACKGROUND OF THE INVENTION

Relatively cumbersome control devices were provided in former tape players to permit the desired pause and rewind operations. These devices were expensive to make and were not easy to keep in good working order.

SUMMARY OF THE INVENTION

In the new apparatus a simple combined dumb wheel and gear or similar device is mounted below the tape deck, and is selectively connectable to an idler shaft which in turn is connected with a drive shaft, by means including the tape to be played, so that operation of the dumb wheel can effect pause and rewind operations in the tape-playing or recording program. Although the new device is very inexpensive, it safely performs these pause and rewind functions, which are generally desired for such a program and which formerly were provided only by more complex devices.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of a tape player equipped with the new rewind and pause mechanism, with parts of its housing and tape deck removed.

FIG. 2 is a sectional elevational view of the complete unit, looking in the direction of line 2-2 in FIG. 1.

FIG. 3 is a bottom view of the unit, with certain bottom parts removed.

FIG. 4 is a schematic, perspective view showing the interaction of basic parts in a new unit of the present type.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIGS. 1 and 2, the new tape-handling apparatus 10 (shown as a tape player and which can also serve in a recording unit) has a housing 11, provided with a cassette-holding recess or cavity 12. This recess allows insertion of a cassette (not shown), wherein a magnetic record tape is stored. Two shafts 13D, 13E extend from lower parts of the housing upwardly into cassette area 12, through the bottom or tape deck 14 in this area. These shafts are adapted to engage tape reels in the cassette. On rotation of drive shaft 13D, the tape is wound up by and onto the reel connected with this shaft, whereby the tape is transported past suitable recording and playback heads 15, 16, as it is unwound from a supply reel on the second and normally idling follower shaft 13F. By means of circuitry on a panel 17 in housing 11, the playback head feeds electrical signals to a loudspeaker 18 in housing 11. The recording head receives audio signals from a suitable microphone system, not shown, when the apparatus is used as a recording unit.

As shown in FIGS. 3 and 4, drive shaft 13D is driven by a motor 19 in housing 11, through motor pulley 20, belt 21, intermediate coaxial pulleys 22, 23, and belt 24 engaging the shaft 13D. Drive shaft 13D engages a drive reel DR in the cassette, and thereby winds tape T onto this reel, unwinding it from follower reel FR on follower shaft 13F. Interposed between the shafts and reels are sleeves 25, frictionally connected with the shafts by wrap springs 25S and firmly gripping the reels by knuckles 25K.

According to the invention, follower or idler shaft 13F is used as a rewind drive means for the tape, and at other times, is used as a means for temporarily stopping the tape. For such purposes, this idler shaft has spur gear 26 rigidly mounted on it, parallel to bottom 14 of cassette recess 12. A matching spur gear 27 is provided for selective engagement with gear 26, but is normally spaced from gear 26 free to idle. This matching gear 27 is press fitted on a pin 28 which is rotatably secured to one end 29 of a reciprocable, and preferably pivotable link 30, by means of a retainer ring 31. Link 30 is shown as a bell crank, pivoted at 32 to a suitable part or extension 14' of tape deck 14 and having opposed end 33 engaged by bored 34 to turn the crank into a normal position wherein its gear 27 is out of mesh with gear 26 on the idler shaft. As indicated by the drawing, bell crank 29 is arranged to rock in a plane parallel to tape deck 14.

When the user wants the tape recorder to pause, he presses spur gear 27, which for this purpose projects outside housing 11 and acts as a thumb wheel, see FIGS. 1 to 3. Manual pressure applied to this wheel readily overcomes the tension of spring 34 and causes spur gear 27 to mesh with gear 26 of idler shaft 13F, as is shown in broken lines (FIG. 4). If the user then continues to hold gear 27, this prevents rotation of idler shaft 13F, thereby stopping supply of tape T from idler reel FR. Drive shaft 13D then slips relative to its sleeve 25 and reel DR, and tape T stands still.

When it is desired to rewind tape T or a portion thereof, for example for monitoring purposes, the user manually presses and rotates thumb wheel 27, thereby rotating gear 26 on the shaft 13F of follower and supply reel FR and causing tape T to be rewound onto this reel. In order to eliminate any possibility of improper manual rotation of idler shaft 13F, a one-way spring clutch 35 is provided, preventing pin 28 of gear 27 from being rotated in the wrong direction. When tape T has been rewound to the approximate desired amount, thumb wheel 27 is released and tape T again moves forward past playback head 16, FIG. 1, producing audible output through speaker 18, FIG. 2. These operations can be repeated if more precise rewinding is desired.

1. A mechanism as described in claim 1, including means supporting said link from the tape deck, so that said reciprocation occurs in a plane parallel to said tape deck.
2. A mechanism as described in claim 1, including a one-way clutch interposed between said link and the rotatable member thereon, the tape player having a tape drive reel and a drive system therefor in addition to said tape reel, and said clutch being oriented so that manual turning of said projecting member can effect, exclusively, rewinding of tape onto said tape reel.
3. A mechanism as described in claim 3, including a slip-clutch interposed between said shaft and its reel, and a similar clutch in said drive system.
4. A mechanism as described in claim 3, wherein said pivot means and link are disposed on the side of said deck opposite said reel.
5. A mechanism as described in claim 3, wherein said rotatable members are spur gears.