

April 17, 1956

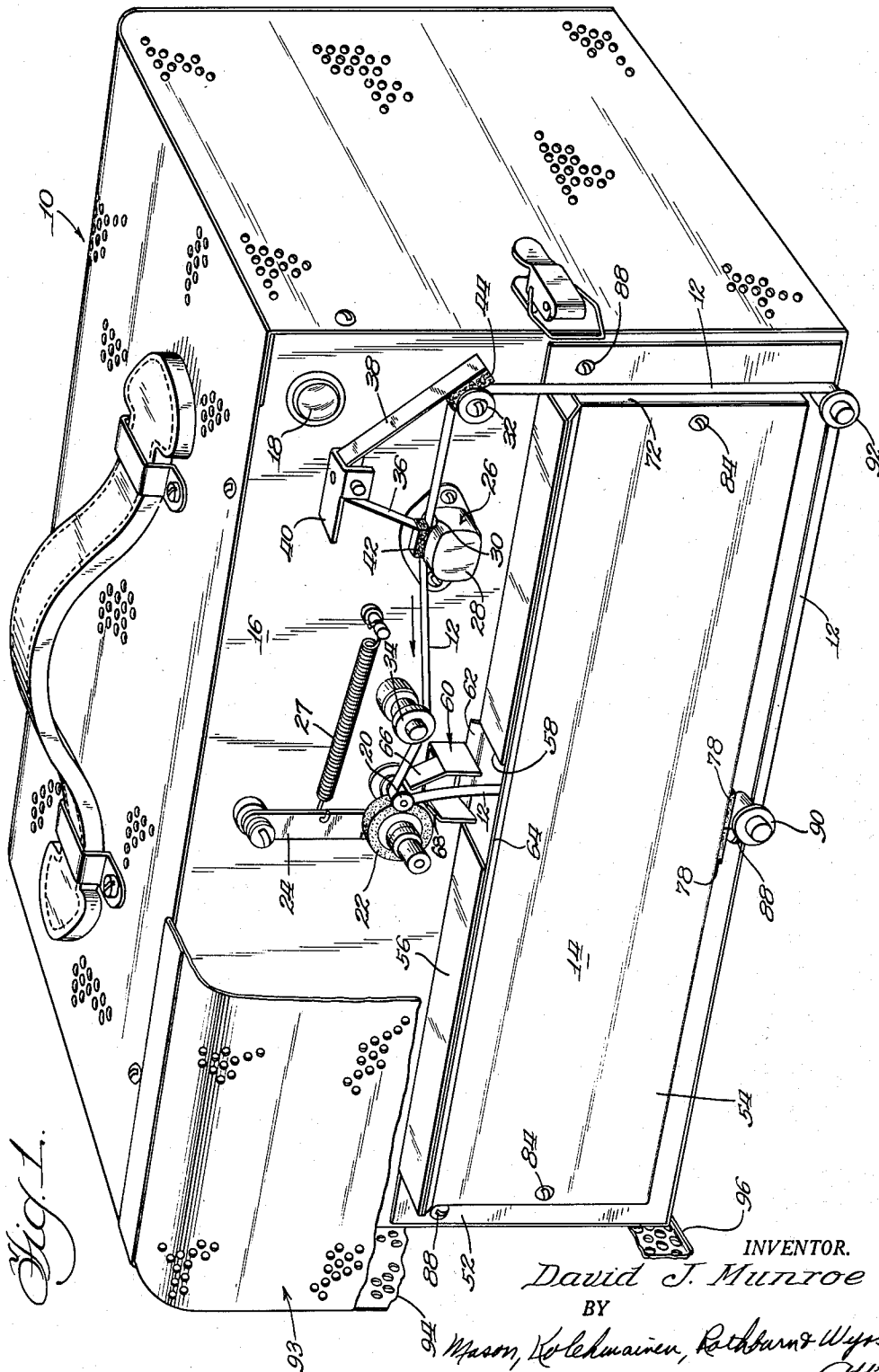
D. J. MUNROE

2,742,284

MAGAZINE FOR AN ELONGATED RECORD MEDIUM

Filed Jan. 19, 1951

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

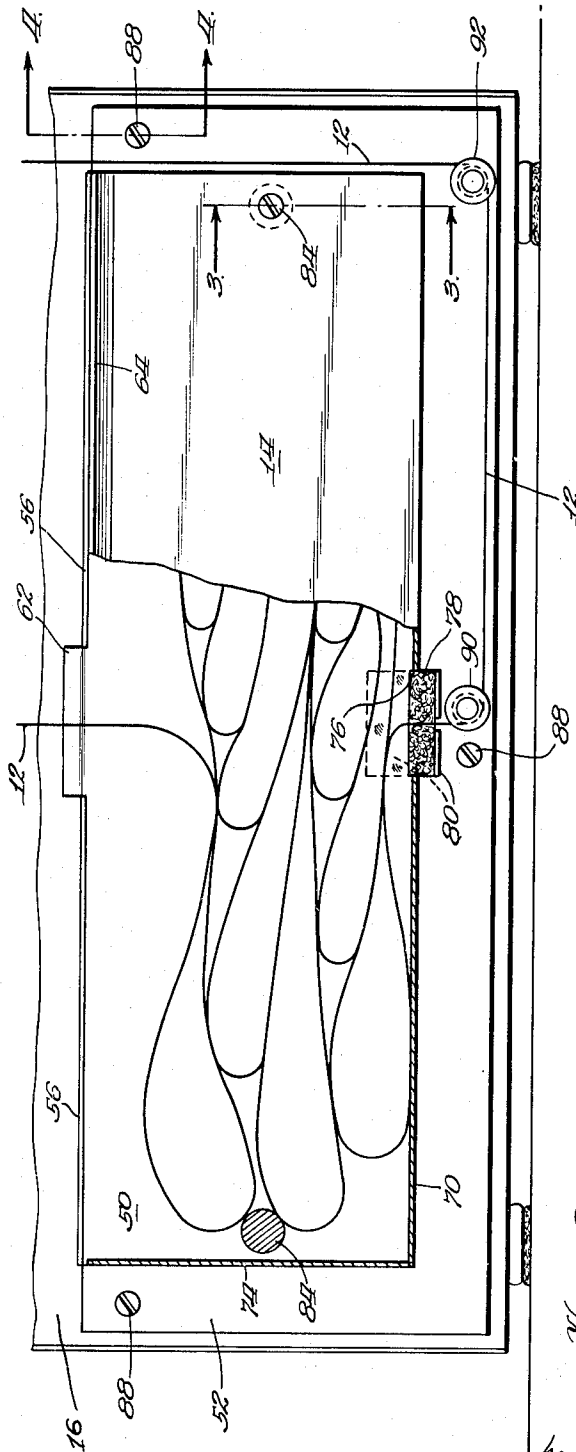


Fig. 2.

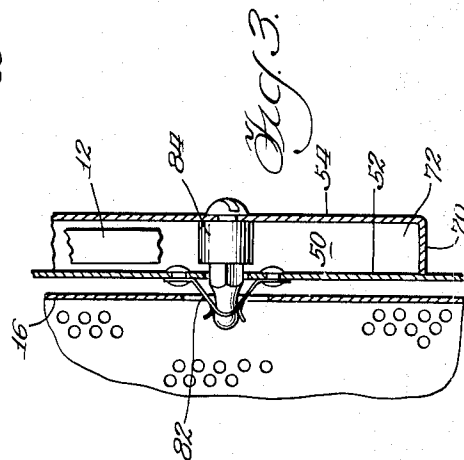


Fig. 3.

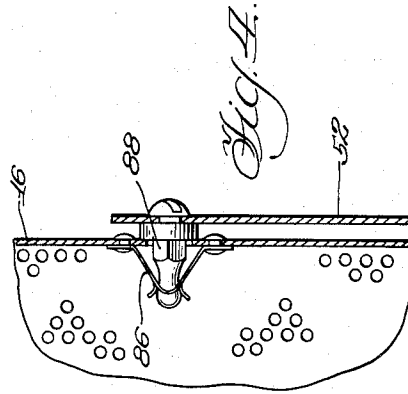


Fig. 4.

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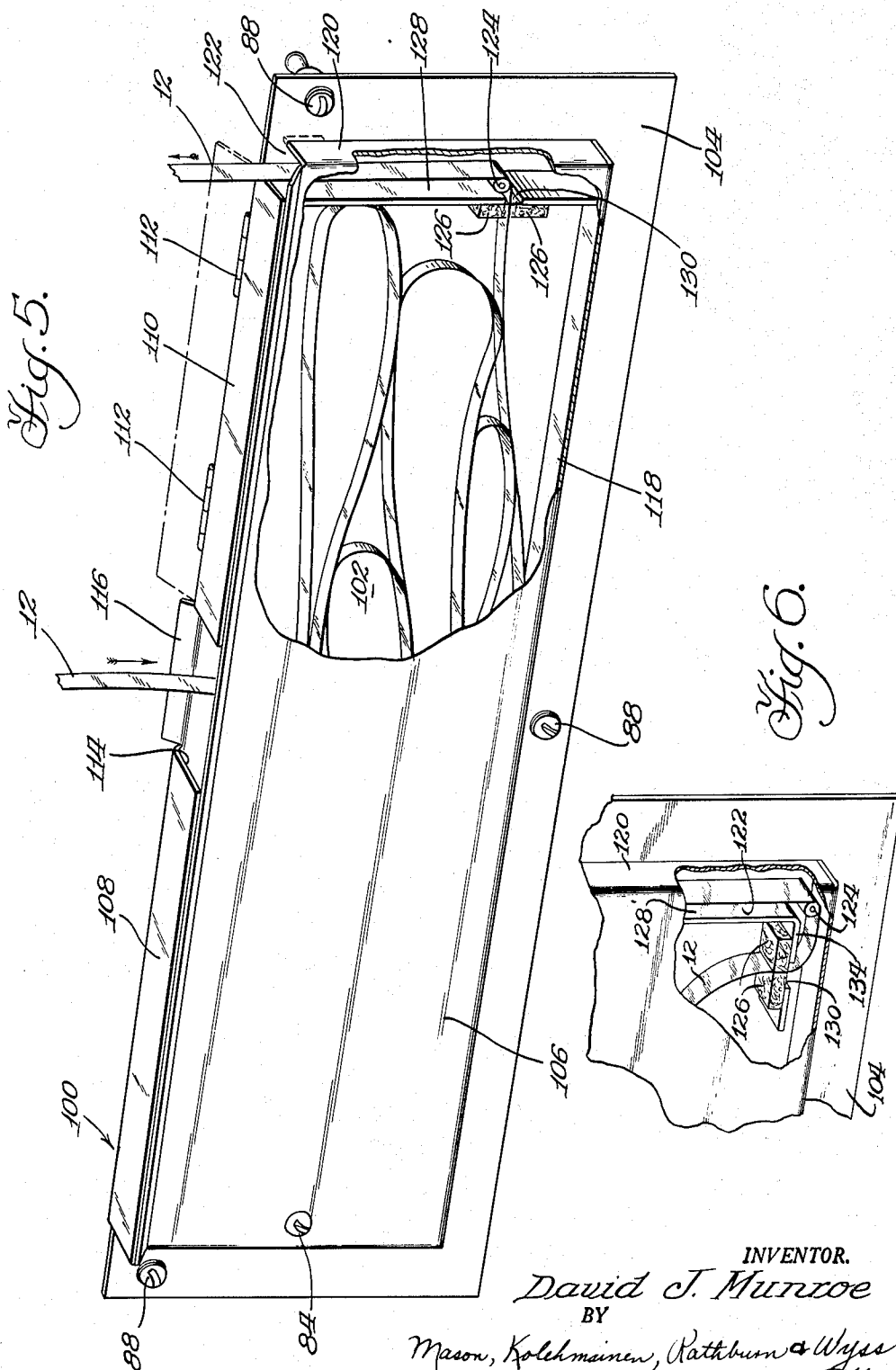
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3 Sheets-Sheet 3



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2,742,284

MAGAZINE FOR AN ELONGATED RECORD MEDIUM

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Application January 19, 1951, Serial No. 206,869

2 Claims. (Cl. 271—2.15)

The present invention relates to a magazine for an elongated record medium.

The magazine of the present invention is capable of folding and holding in a storage chamber a substantial length of an elongated record medium, which may be a tape of the type commonly used in magnetic recorder-reproducer apparatus. The invention has for its primary object the provision of a new and improved magazine of this character and also the provision of a new and improved reproducer apparatus with which the magazine is associated.

A further object of the present invention is to provide a new and improved magazine for holding lengths of elongated record medium which is simple and inexpensive to construct, which may be readily attached to and detached from associated apparatus such as a reproducer, and which is constructed with record medium guiding means adapted cooperatively to be associated with record medium driving and guiding means forming part of the apparatus.

A further object of the present invention is to provide a new and improved apparatus for reproducing from an elongated record medium, which apparatus has associated with it a magazine adapted detachably to be placed on the front of the apparatus, the apparatus being so constructed and arranged that different sized magazines may readily be placed thereon.

Another object of the present invention is to provide a new and improved record medium magazine in which both the inlet and outlet openings are located at a side that is in close proximity to the recording or reproducing apparatus thereby avoiding a considerable length of medium moving outside the magazine where it would be likely to be broken or otherwise damaged.

A still further object of the present invention is to provide a new and improved record medium magazine so constructed and arranged that the medium can be entirely enclosed within the magazine whereby the latter can be transported or mailed without likelihood of injury to the medium which can be shipped in the magazine. This safety feature can also be utilized during standby periods when the recorder-reproducer apparatus is not being used or is being moved from one location to another.

In brief, the present invention comprises structure defining a storage chamber for an elongated record medium, which structure includes spaced apart front and back walls and upper and lower sides and including entrance and exit openings providing for the ingress and egress of the record medium, which may be magnetic tape of the type commonly used with magnetic recorder-reproducer apparatus. The magazine is especially intended to hold and store, so to speak, a substantial length of an endless tape which is utilized as for announcement purposes. The tape enters the chamber through an enlarged inlet opening and leaves the chamber through an exit opening. The discharge is effected through felt pads engaging the tape so as to prevent more than a single strand or ribbon of the tape from being discharged and to maintain the tape under tension.

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The tape is automatically folded inside the chamber so that a substantial quantity of tape is loosely held in the chamber. The magazine is provided with securing means cooperatively associated with complementary securing means on the apparatus whereby the magazine may be readily attached to or detached from the apparatus. This enables magazines with tapes having different announcements or the like to be placed on the apparatus for reproduction. Furthermore, the front wall is detachably secured to the back wall to facilitate initial placement of the tape in the chamber as well as change of tapes. The magazine is also provided with tape guiding means located for association with tape leaving the chamber and with other guiding means guiding the tape in its movement to a transducer and tape guiding and driving means forming part of the apparatus. The magazine is mounted in front of the apparatus clear of obstructions so that magazines of different depths may be utilized, even magazines extending below the bottom of the apparatus proper. The magazine may also be constructed with the entrance and exit openings in close proximity, as at the top of the magazine, to the associated recorder-reproducer apparatus so as to reduce to a minimum the length of medium exposed in use. Also, the portion of the magazine between the entrance and exit openings may be openable to enable the medium totally to be enclosed in the magazine, for shipment, etc.

Other objects and advantages of the present invention will become apparent from the ensuing description of an illustrative embodiment thereof, in the course of which reference is had to the accompanying drawings, in which:

Fig. 1 is a perspective view of a magnetic reproducer constructed in accordance with the invention, the view illustrating but part of a perforated removable cover forming part of the apparatus;

Fig. 2 is a fragmentary front elevation, partly broken away to illustrate details of the magazine;

Figs. 3 and 4 are fragmentary vertical transverse cross sectional views taken along the lines 3—3 and 4—4 of Fig. 2;

Fig. 5 is a partly broken away perspective view of another form of magazine constructed in accordance with the present invention; and

Fig. 6 is a fragmentary perspective view with portions broken away to illustrate a modification of the magazine shown in Fig. 5.

Referring now to the drawings, and first particularly to Fig. 1, the present invention has been illustrated in connection with an apparatus for reproducing records from an elongated record medium, the specific apparatus illustrated being a magnetic reproducer 10 employing a magnetic tape 12, upon which a suitable message is recorded. The reproducer includes tape driving means and reproducing means to be described later and a novel magazine indicated as a whole by reference character 14, which is detachably secured to the front wall 16 of the reproducer.

In order to provide a better understanding of the nature and advantages of the present invention, it might be stated that the reproducer here illustrated is intended for use in making periodic announcements or making such announcements in response to an automatic control function occurring as upon the opening of a door or cover or the like. Or, the apparatus might be placed into continuous operation upon depression of a control button 18 at the front of the reproducer 10, which button constitutes an apparatus start and run button. However, the starting and stopping of the reproducer can be effected automatically as hereinbefore mentioned. Under automatic operation the reproducer is started as by the opening of a door or a cover and it operates until the tape, which may be an endless tape, completes a cycle of movement, whereupon the

reproducer is deenergized and placed in temporary non-operative condition.

The tape 12, upon which a suitable message is recorded, is driven by a rotatable constant speed capstan 20 having an annular groove adapted fairly snugly to receive the tape. The tape is held against the capstan by a pinch roller 22 mounted on a pivotally movable arm 24 biased toward the capstan as by a spring 27.

The tape driving means is located in advance of a suitable transducer 26 mounted upon the front wall 16 of the reproducer and including a housing 28 having a longitudinal opening 30 enabling the tape to come into close proximity with the magnetic core of an electro-magnetic pickup device which may be of the type disclosed and claimed in my co-pending application Serial No. 79,663, filed March 4, 1949, and assigned to the assignee of this application now abandoned but superseded by application Serial No. 408,235, filed February 14, 1954.

The tape is guided past the transducer and capstan by a pair of idler rollers 32 and 34 in advance of the transducer and capstan, respectively, and in alignment therewith. The tape is held against the transducer and idler roller 32 by suitable biasing means such as the spring arms 36 and 38 secured to a bracket 40 pivotally mounted on the front wall 16 of the reproducer. Suitable pads, such as the felt pads 42 and 44, may be placed at the ends of the arms for engagement with the tape.

The magazine 14 of the present invention includes a tape storage chamber 50 comprising a back wall 52, and a front wall 54 spaced therefrom a distance readily to receive the tape, see Fig. 3. It includes also a top wall 56, preferably constituted by an integral forwardly extending flange of the back wall and provided with a relatively long entrance opening 58 through which the tape enters the storage chamber. The ingress of the tape into the chamber is facilitated by flaring the opening somewhat and by associating with it guiding means 60. The flaring is easily provided by an upwardly and rearwardly inclined flange 62 on the back wall and upwardly and forwardly inclined flange 64 on the front wall 54, which flange can extend the full length of that wall. The guiding means 60 comprise a generally U-shaped structure, the bight of which is secured to the front wall and from the legs of which there extend the opposed arms 66 and 68 terminating near the capstan.

The magazine includes also a bottom wall 70 and end walls 72 and 74, constituted as by integral rearwardly extending flanges of the front wall. The bottom wall is provided with a tape exit opening 76 within which are mounted a pair of felt pads 78 adapted to engage opposite sides of the tape, see Fig. 2, thereby to prevent more than a single thickness of the tape from being discharged and to maintain the tape under tension. The pads may be mounted upon a flanged supporting bracket 80, the vertical back of which is secured to the rear of the back wall 52 and the horizontal spaced flanges of which extend through the back wall to receive the pads so that the pads are located substantially in the exit opening 76.

In accordance with another feature of the invention the front and back walls of the magazine are detachably supported and secured to each other by means enabling ready attachment and detachment. For this purpose the rear wall is provided with resilient fastening clips 82, only one of which is shown in Fig. 3, and the front wall with a ball-ended rearwardly extending fastening post 84. This construction enables the ready initial placing of the tape in the magazine as well as substitution of one tape for another.

The magazine as a whole itself is portable and is also adapted detachably to be secured to the front panel 16 of the reproducer by fastening means enabling ready attachment and detachment. The fastening means may be identical with that already described and include a spring clip 86 and a ball-ended fastening post 88, the former being mounted on the front panel 16 and the latter on the

rear wall 52. It is preferred that three of the latter fastening means be used, there being one at each of the upper corners and one at the center lower part of the back wall.

The use and operation is also facilitated, in accordance with the present invention, by providing tape guiding means on the magazine. The guiding means may take the form of idler rollers 90 and 92, both of which may be, as illustrated, secured to the back wall and the former of which is located below the tape exit opening and the latter in alignment with the guide roller 32 mounted upon the front panel in advance of the pickup head.

The tape may be protected in use by a cover having a perforated top and front wall 93 and side walls 94 of which but one has been shown and with a substantially open bottom wall defining a slot 96. The bottom wall is made open so that magazines having heights different from that illustrated may be placed on the apparatus so that longer tape lengths may be used. In this connection it should be noted that the present magazine and reproducer are so constructed and arranged that magazines of various heights may be used without any different mode of installation or operation.

Assuming that a magazine has been placed on the reproducer and the tape threaded past the guiding and driving means and the transducer, and the reproducer placed in operation as by depression of the start button 18, the tape is moved past the transducer by the cooperative action of the capstan and pinch roller. The signals previously placed on the tape are now reproduced periodically as complete lengths of the tape pass by the transducer. A considerable length of tape may be stored in the magazine chamber which it enters through the inlet opening 58 and wherein it is folded in a somewhat haphazard fashion as illustrated in Fig. 2. It leaves the magazine at a rate determined by the drive and past the pads 78 which maintain the tape under tension.

When it is desired to change the message being reproduced, the magazine can be removed along with the tape and another magazine with a tape having a different message can be substituted, or, if desired, the front wall of the magazine alone may be removed for substitution of a new tape.

Referring now to Fig. 5, there is illustrated a modified magazine constructed and arranged to reduce the length of tape exposed between the magazine and associated apparatus, thereby minimizing the likelihood of damage to the tape. The magazine is also characterized by a construction enabling the tape entirely to be enclosed in the magazine so that the magazine can be used as a shipping or storage container or as a holding device for the tape when the apparatus is moved from place to place with the magazine on it.

The magazine is indicated in Fig. 5 by the reference character 100. It includes a tape storage chamber 102 defined by a back wall 104 and a front wall 106 spaced therefrom, the back and front walls corresponding generally to the walls 52 and 54 of the previously described embodiment. The magazine also includes a top wall comprising a first portion 108 constituted as by an integral forwardly extending flange on the back wall and a second portion 110 which is openable either by removal or hinged movement relative to the magazine, the latter type of construction being illustrated and the hinges being indicated by the reference characters 112. If desired the hinged portion can be held in closed position as by suitable latching or spring type biasing means. These two portions are separated sufficiently to provide the magazine with a relatively long entrance opening 114 having associated with it the flare providing flange 116.

The magazine includes also a bottom wall 118 and spaced end walls, of which only the end wall 120 is shown. The upper end of the latter is spaced a short distance from the top wall portion 110, thereby to provide a tape exit opening 122 from which the tape emerges

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upwardly in line with the tape guiding roller 32 shown in Fig. 1.

The tape is guided through the exit opening by tape guiding means taking the form of a pin 124 which can be secured to the back wall of the magazine. This pin is located substantially in line with the guiding roller 32 and the exit opening 122 so that the tape freely moves out of the magazine.

The tape is maintained taut and more than a single strand or loop is prevented from being pulled out of the magazine by the tape engaging felt pads 126 secured forward, in so far as tape movement is concerned, of the guiding means 124. The pads are mounted upon a suitable support, which may take the form of a vertically extending element 128 defining, in effect, a partition preventing the tape loops in the magazine from getting tangled with and interfering with the discharge of the tape 12 from the magazine. The support 128 is provided with a transverse slot 130 through which the tape moves, this slot being in line with the opening between the pads and the guide pin 124. It should be noted also that the support-partition 128 extends approximately to the bottom of the magazine and divides the storage chamber into what may be called a main storage chamber and an exit chamber.

Other than described above, the magazine generally corresponds to that previously described. For example, the detachable fastening means may be substantially the same and have been indicated by reference characters corresponding to those previously used.

Referring to Fig. 6, there is illustrated a slight modification of the magazine of Fig. 5 with the corresponding parts designated by the same reference numerals. In this case the vertically extending element 128' is provided with a horizontal extension 134 having the transverse slot 130 defined therein through which the tape 12 leaves the magazine, this exit opening being at the bottom of the magazine. The same pads 126, and guiding means 124 would still be employed. The support 128' again divides the magazine into a main storage chamber and an exit chamber with the tape exit opening at the bottom.

It will be apparent to those skilled in the art from the foregoing detailed description of the invention that the location of the entrance and exit openings at or near the top wall of the magazine places these openings very close to the associated recorder-reproducer apparatus, thereby minimizing and reducing to a minimum the length of tape that is exposed during use of the apparatus. Also,

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the magazine can be used as a container for the tape for separate shipment or when the magazine is placed on the apparatus and the latter is carried from place to place.

While the present invention has been described in connection with the details of illustrative embodiments thereof, it should be understood that these details are not intended to be limitative of the invention except in so far as set forth in the accompanying claims.

Having thus described my invention, what I desire to claim as new and desire to secure by Letters Patent of the United States is:

1. A portable storage magazine for holding an elongated length of record medium and adapted to be detachably mounted on a supporting member comprising a first wall member, a second wall member having flanges on the sides and bottom edge thereof, means for detachably mounting said second wall member on said first wall member to define a cavity for receiving said record medium, partition means positioned within said cavity adjacent one of said flanges and extending from the top toward the bottom of said cavity to define an exit passageway, said partition means having an opening therein spaced upwardly from said bottom flange, means integral with said first wall and extending outwardly therefrom toward said second wall to partially close said cavity, and means movably mounted on said first wall and spaced from both said integral portion and from one of said side flanges to define an entrance opening and an exit opening in alignment with said passageway.

2. The storage magazine set forth in claim 1 in which the partition means includes means spaced from and extending parallel to the bottom flange of the second wall member to define an extension of said exit passageway in communication with said cavity.

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