

SPECIFICATION

A box for storing an encased magnetic recording tape

- 5 The present invention relates to a box for storing a magnetic recording tape. Boxes for storing tape cassettes or cartridges are known. However, most such known boxes do not protect the tape from the
- 10 adverse effects produced by humidity, dust and oxidation. It is also difficult to identify the contents of known boxes without opening the box. Thus, when a particular tape is sought from amongst a plurality of tapes, a number of boxes often need to be opened to
- 15 locate the desired tape. This is both time-consuming and inconvenient. A rotary case for holding and classifying tape cassettes and cartridges is also known but such a case occupies a large volume and is not particularly practical.
- 20 The present invention seeks to provide a box for receiving a magnetic tape cassette or cartridge which overcomes the disadvantages of conventional boxes.

The invention also seeks to provide a box which is

25 capable of being connected to similar boxes to provide an arrangement occupying a minimal amount of space whilst still providing adequate protection for the tapes received therein.

According to the present invention, there is provided a box for receiving a magnetic recording tape cassette or cartridge comprising:

- 30 an open-ended sleeve member having a top wall on the exterior surface of which rails and a flange member are provided and a bottom wall on the exterior surface of which channels and a recess are
- 35 formed, the channels and recess corresponding respectively to the rails and flange member said bottom wall having a recess formed therein, the sleeve member further comprising a back wall and
- 40 side walls inter-connecting the top and bottom walls, the side walls each having a flat external surface:
- a drawer insertable into the sleeve member, the drawer having an internal space for receiving the tape cassette or cartridge, the drawer having a front
- 45 wall, which, in use, closes one open end of the sleeve member, a rear wall, and a base portion, the base portion having a groove formed on its underside, the groove decreasing in depth of the front to the back thereof;

- 50 a spring member located between the back wall of said sleeve and the rear wall of the drawer; and

- a steel ball which is guided partially in the recess and partially in the groove, wherein when the drawer is inserted into the sleeve member, the steel ball
- 55 travels along a longitudinal portion of the groove whilst being retained in the recess, the ball reaching a rest position at the front end of the groove, the drawer remaining in a closed position against the action of the spring until the spring is compressed by
- 60 the application of a force tending to push the drawer further into said sleeve, the spring force causing the drawer to open when the applied force is removed, the application of the applied force forcing the ball forwardly in the groove and the spring force causing
- 65 the drawer to open causing the ball to move

rearwardly in the groove.

The invention will be further described, by way of example only, with reference to the accompanying drawings, in which:-

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Figure 1 is a top perspective view of a box in accordance with the present invention;

Figure 2 is a bottom perspective view of the box shown in *Figure 1*;

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Figure 3 is a perspective view of the interior of a sleeve member forming part of the box shown in *Figures 1* and *2*;

Figure 4 is a view of a groove for a steel ball formed on the underside of a drawer member

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forming part of the box shown in *Figures 1* and *2*;

Figure 5 shows a perspective view of one manner in which boxes of the type shown in *Figures 1* and *2* may be interconnected;

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Figure 6 shows an alternative manner of connecting boxes of the type shown in *Figures 1* and *2* together;

Figure 7 is a top perspective view of a second embodiment of a sleeve member forming part of a box in accordance with the present invention;

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Figure 8 is a bottom perspective view of the sleeve member shown in *Figure 7*;

Figure 9 is a perspective view of one manner of interconnecting boxes of the type shown in *Figures 7* and *8*;

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Figure 10 is the perspective view of an alternative manner of interconnecting boxes of the type shown in *Figures 7* and *8*; and

Figure 11 is a perspective view of an interconnected arrangement of boxes of the type shown in *Figures 7* and *8*.

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A box in accordance with the present invention comprises a sleeve member shown in the upper half of the *Figure* and a drawer member shown in the latter half of the *Figure*. The top wall 1 of the sleeve member has two parallel rails 11, 11' formed therein, each rail having a vertical laterally outer side wall and an inclined, laterally inner side wall. Between the two parallel rails, a flange portion 12 is provided, the flange defining two groove sections 13, 13'. The drawer which is inserted into the sleeve comprises a base 3 for receiving a tape cassette or cartridge, a front wall 31 and a rear wall 35. A label identifying the tape may be stuck onto the front wall 31. Two upstanding projections 32, 32' formed on the base 3

110 in use, engage in the holes formed in the two hubs of the cassette. In the base 3 two channels 33, 33' and two slots 34, 34' are formed.

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The bottom wall 2 of the sleeve, as shown in *Figure 2*, has two channels 21, 21' and a recess 22 formed thereon which correspond respectively to the rails 11, 11' and the flange 12 formed on the top wall 1 of the sleeve shield respectively. An inclined block 23 projects downwardly from the surface of the recess 22. The underside of the base 3 has a groove 36 formed therein around which a steel ball 28 may travel. The front end 37 of the groove 36 is in the form of a loop having a shape shown best in *Figure 4*. The groove 36 has a gradually decreasing depth in its rear end region.

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The internal structure of the sleeve member is

shown in Figure 3. A rounded protuberance 25, which is connected to a spring 26 is provided, as is a strip 29 which is connected to the bottom wall 2. The two edges 291, 291' of the strip engage in the corresponding channels 33, 33' formed on the base 3 of the drawer. Adjacent the front end of the strip 29 and, as shown, substantially centrally disposed is a recess 27 having a steel ball 28 retained therein.

The relationship between the steel ball 28 and the groove 36, when opening and closing the drawer, is best seen in Figure 4. As the two edges 291, 291' of the strip 29 on the bottom wall 2 of the sleeve member are in engagement with the two channels 33, 33' formed on the underside of the base 3 of the drawer, the steel ball 28 is held between the recess 27 in the strip 29 and the groove 36 formed on the underside of the base of the drawer. When the drawer is closed, the steel ball 28 is located in the position A at the front end 27 of the groove 36, as is shown in Figure 4. When the front wall 31 of the drawer is pressed inwardly slightly, the ball 28 is constrained to move to position B in the groove. When the pressure applied to the front wall 31 is removed, the spring 26 urges the drawer out of the sleeve and the ball passes through positions C and D and finally occupies position G. When the drawer is retracted to its maximum extent, the cassette or cartridge tape can easily be removed therefrom. When the pressure is applied to the front wall 31 to close the drawer, the ball is constrained to move to position F, passing through position D.

However, because the spring 26 is still acting on the drawer, the final position of the ball will be in position A at which it stops. When the ball reaches position A, the front wall 31 of the drawer will be just inside the sleeve and the box is effectively closed.

Figure 5 shows how boxes of the type described above may be connected together to form a vertical arrangement by engaging the channels 21, 21' and the recess 22 on the underside 2 of one sleeve with the rails 11, 11' and the flange 12 respectively on the top wall 1 of an adjacent sleeve. Furthermore the inclined block 23 on the bottom wall 2 of the sleeve engages in groove 13 or in the groove 13'.

Figure 6 shows boxes of the type described hereinbefore connected together to form horizontal arrangement by using a connector member 4. This member 4 connects the rails 11, 11' of adjacent boxes and, for this purpose, is provided with two inwardly sloping walls corresponding to the inclined walls of the rails 11, 11'. Figure 6 does, in fact, show the horizontal interconnection connection of a plurality of columns of boxes which have previously been connected together to form a vertical arrangement.

Figures 7 to 11 show a second embodiment of the present invention. By suitably designing the rails 91, 91' and the flange 92 on the top wall of the sleeve and the channels 81, 81' and the recess 82 on the bottom wall of the sleeve in the manner shown in Figures 7 and 8, two boxes can be connected together horizontally utilising a third box instead of a connector.

The present invention thus provides a box which may be interconnected with one or more similar

boxes. Due to the fact that the sleeve has side walls which are flat externally the boxes are easy to manufacture. In addition, the box can be used for securely keeping a magnetic recording tape within a dust-free environment. Furthermore, the ball and groove locking means allows the encased magnetic recording tape to be simply placed in the drawer so that it can be easily slid into and out of the sleeve member.

CLAIMS

1. A box for receiving a magnetic recording tape cassette or cartridge comprising:

- an open-ended sleeve member having a top wall on the exterior surface of which rails and a flange member are provided and a bottom wall on the exterior surface of which channels and a recess are formed, the channels and recess corresponding respectively to the rails and flange member, said bottom wall having a recess formed therein, the sleeve member further comprising a back wall and side walls inter-connecting the top and bottom walls, the side walls each having a flat external surface;
- a drawer insertable into the sleeve member, the drawer having an internal space for receiving the tape cassette or cartridge, the drawer having a front wall, which, in use, closes one open end of the sleeve member, a rear wall and a base portion, the base portion having a groove formed on its underside, the groove decreasing in depth of the front to the back thereof;

a spring member located between the back wall of said sleeve and the rear wall of the drawer; and

- a steel ball which is guided partially in the recess and partially in the groove, wherein when the drawer is inserted into the sleeve member, the steel ball travels along a longitudinal portion of the groove whilst being retained in the recess, the ball reaching a rest position at the front end of the groove, the drawer remaining in a closed position against the action of the spring until the spring is compressed by the application of a force tending to push the drawer further into said sleeve, the spring force causing the drawer to open when the applied force is removed, the application of the applied force forcing the ball forwardly in the groove and the spring force causing the drawer to open causing the ball to move rearwardly in the groove.

2. A box for receiving a magnetic recording tape cassette or cartridge as claimed in claim 1, wherein a plurality of said boxes are connectable horizontally by locating flat external side wall surfaces of two adjacent boxes together and by engaging the recess in the bottom wall of a third box located above the two adjacent boxes with one of the rails on the top wall of each of two adjacent boxes, thereby connecting the two adjacent boxes horizontally by means of the third box vertically positioned thereover.

3. A box for receiving a magnetic recording tape cassette or cartridge as claimed in claim 1, wherein a plurality of boxes are connected vertically by positioning each box such that the rails and flange on the top wall of the box are engaged within the corresponding channels and recess on the bottom wall of a



shown in Figure 3. A rounded protuberance 25, which is connected to a spring 26 is provided, as is a strip 29 which is connected to the bottom wall 2. The two edges 291, 291' of the strip engage in the

5 corresponding channels 33, 33' formed on the base 3 of the drawer. Adjacent the front end of the strip 29 and, as shown, substantially centrally disposed is a recess 27 having a steel ball 28 retained therein.

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10 groove 36, when opening and closing the drawer, is best seen in Figure 4. As the two edges 291, 291' of the strip 29 on the bottom wall 2 of the sleeve member are in engagement with the two channels 33, 33' formed on the underside of the base 3 of the

15 drawer, the steel ball 28 is held between the recess 27 in the strip 29 and the groove 36 formed on the underside of the base of the drawer. When the drawer is closed, the steel ball 28 is located in the position A at the front end 27 of the groove 36, as is

20 shown in Figure 4. When the front wall 31 of the drawer is pressed inwardly slightly, the ball 28 is constrained to move to position B in the groove. When the pressure applied to the front wall 31 is removed, the spring 26 urges the drawer out of the

25 sleeve and the ball passes through positions C and D and finally occupies position G. When the drawer is retracted to its maximum extent, the cassette or cartridge tape can easily be removed therefrom. When the pressure is applied to the front wall 31 to

30 close the drawer, the ball is constrained to move to position F, passing through position D.

However, because the spring 26 is still acting on the drawer, the final position of the ball will be in position A at which it stops. When the ball reaches

35 position A, the front wall 31 of the drawer will be just inside the sleeve and the box is effectively closed.

Figure 5 shows how boxes of the type described above may be connected together to form a vertical arrangement by engaging the channels 21, 21' and

40 the recess 22 on the underside 2 of one sleeve with the rails 11, 11' and the flange 12 respectively on the top wall 1 of an adjacent sleeve. Furthermore the inclined block 23 on the bottom wall 2 of the sleeve engages in groove 13 or in the groove 13'.

Figure 6 shows boxes of the type described hereinbefore connected together to form horizontal arrangement by using a connector member 4. This member 4 connects the rails 11, 11' of adjacent

45 boxes and, for this purpose, is provided with two inwardly sloping walls corresponding to the inclined walls of the rails 11, 11'. Figure 6 does, in fact, show the horizontal interconnection connection of a plurality of columns of boxes which have previously been connected together to form a vertical arrange-

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Figures 7 to 11 show a second embodiment of the present invention. By suitably designing the rails 91, 91' and the flange 92 on the top wall of the sleeve and the channels 81, 81' and the recess 82 on the

60 bottom wall of the sleeve in the manner shown in Figures 7 and 8, two boxes can be connected together horizontally utilising a third box instead of a connector.

The present invention thus provides a box which

65 may be interconnected with one or more similar

boxes. Due to the fact that the sleeve has side walls which are flat externally the boxes are easy to manufacture. In addition, the box can be used for securely keeping a magnetic recording tape within a dust-free environment. Furthermore, the ball and groove locking means allows the encased magnetic recording tape to be simply placed in the drawer so that it can be easily slid into and out of the sleeve member.

CLAIMS

1. A box for receiving a magnetic recording tape cassette or cartridge comprising:

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- 85 respectively to the rails and flange member, said bottom wall having a recess formed therein, the sleeve member further comprising a back wall and side walls inter-connecting the top and bottom walls, the side walls each having a flat external surface;
- 90 a drawer insertable into the sleeve member, the drawer having an internal space for receiving the tape cassette or cartridge, the drawer having a front wall, which, in use, closes one open end of the sleeve member, a rear wall and a base portion, the
- 95 base portion having a groove formed on its underside, the groove decreasing in depth of the front to the back thereof;

a spring member located between the back wall of said sleeve and the rear wall of the drawer; and

- 100 a steel ball which is guided partially in the recess and partially in the groove, wherein when the drawer is inserted into the sleeve member, the steel ball travels along a longitudinal portion of the groove whilst being retained in the recess, the ball reaching
- 105 a rest position at the front end of the groove, the drawer remaining in a closed position against the action of the spring until the spring is compressed by the application of a force tending to push the drawer further into said sleeve, the spring force causing the drawer to open when the applied force is removed, the application of the applied force forcing the ball
- 110 forwardly in the groove and the spring force causing the drawer to open causing the ball to move rearwardly in the groove.

- 115 2. A box for receiving a magnetic recording tape cassette or cartridge as claimed in claim 1, wherein a plurality of said boxes are connectable horizontally by locating flat external side wall surfaces of two adjacent boxes together and by engaging the recess
- 120 in the bottom wall of a third box located above the two adjacent boxes with one of the rails on the top wall of each of two adjacent boxes, thereby connecting the two adjacent boxes horizontally by means of the third box vertically positioned thereover.

- 125 3. A box for receiving a magnetic recording tape cassette or cartridge as claimed in claim 1, wherein a plurality of boxes are connected vertically by positioning each box such that the rails and flange on the top wall of the box are engaged within the corresponding channels and recess on the bottom wall of a
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second box located thereover.

4. A box for receiving a magnetic recording tape cassette or cartridge substantially as hereinbefore described with reference to and as illustrated in the
- 5 accompanying drawings.

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