

Magnetic-tape-cassette apparatus with two push-buttons.

The invention relates to a magnetic-tape-cassette apparatus comprising two push-buttons and associated function rods which, when the push-button rods are pressed inward over the length of an inward stroke, cause parts of the apparatus to perform separate functions, and comprising
5 a third function rod which when actuated causes a part of the apparatus to perform a further separate function and is provided with a control member which is arranged on a support and relative to the direction of movement of the
10 push-button rods is laterally movable in a first plane, a lateral movement of the control member enabling the associated push-button rod to be moved by means of guide faces, which are inclined relative to the direction of movement, each time that only one push-button rod is moved
15 inward, whilst the guide faces inhibit a lateral movement of the control member when the two push-button rods are moved inward together, in such a manner that the third function can be performed, during which the control member can be moved inward with the push-button rods and the
20 support and the control member are urged into a centre position by return means.

Such a magnetic-tape apparatus is known from DE-OS 32 26 718. Said magnetic-tape apparatus comprises two push-button rods, one of these rods, when actuated separately,
25 switching the apparatus to, for example, fast forward winding. If the other push-button is depressed separately the apparatus is set to fast reverse winding. If both rods are actuated together this causes a cassette which has been played to be ejected from the cassette holder via the third
30 functional part of the apparatus. In order to enable this additional function of the push-buttons and push-button rods to be realised the push-button rods are formed with guide slots which co-operate with a pin-shaped control member which can act upon the third functional part.

It is an object of the invention to ensure that in an apparatus of the type defined in the opening paragraph one or both push-button rods, which upon depression have moved separately one after the other past the control member, can move back jointly past the control member.

According to the invention this object is achieved in that the control member is arranged to be movable perpendicularly to the first plane against the force of a spring and in that the push-button rods exhibit bevelled edges so that in the case that the movable control member is laterally blocked the push-button rods can press said member away in a direction perpendicular to the first plane during the return movement.

When the two push-button rods return they press the control member upwards and can move underneath this member to resume their initial positions. This construction prevents the depressed push-button rods from being blocked as a result of incorrect actuation.

In a further embodiment of the invention a spring arm urges the support and the control member into their centre positions. Such a spring arm can be manufactured easily from a plastics material and can be injection-moulded integrally with the other parts on the third function rod.

In a further embodiment of the invention the longitudinal walls of the box constitute stops to inhibit an excessive excursion of the supporting arm carrying the control member. The guide opening thus formed limits the actuating movements of the control member in a lateral direction. The walls of the guide opening limit the lateral movement of the control member, thus enabling the control member to return more rapidly to its centre position.

In a further embodiment of the invention the support the support carrying the control member is arranged in a box in whose interior the projections of the push-button rods, which projections have bevelled edges, are guided between outer walls of the box and guide strips.

Such a box constitutes a well-defined guide opening.

In a further embodiment of the invention the rear wall of the box is provided with a knife-edge bearing for the support of the control member and return means
5 which urge the support into its centre position which is oriented in the direction of inward movement. Such a knife-edge bearing operates with a low friction and provides a stable linear guidance.

In a further embodiment of the invention a
10 spring arm, which is arranged on the front wall, acts upon the control member and in its centre position extends in the direction of inward movement. This improves the spring return to the centre position.

The invention will now be described in more
15 detail with reference to the accompanying drawings. In the drawings:

Fig. 1 is a plan view of the apparatus to
illustrate the cooperation between the function rod and the
two push-button rods,

20 Fig. 2 is a sectional view of the box and a side view of the parts situated inside the box, taken on the line VIII-VIII in Fig. 1.

Fig. 1 shows diagrammatically, separated from
a magnetic-tape apparatus, the push-buttons 1, 3 which can
25 be operated by the user, the push-button rods 5, 7 actuated thereby, and an ejection rod 9 for ejecting a cassette from a cassette holder, not shown.

The exemplary embodiment is of special
significance when the push-buttons 1 and 3 are depressed
30 simultaneously. In the present case an extension 19 of the third function rod 9 is provided with an injection-moulded rectangular box 35 which together with other injection-moulded parts is integral with the third function rod 9. Nose-shaped projections 36 of the push-button rods 5 and 7
35 are guided so as to be movable inside the interior 34 of the rectangular box 35, which constitutes a guide opening. An L-shaped support 37 is arranged inside the box 35. An arm of the L-shaped support 37 extends in the longitudinal

direction of the push-button rods 5 and 7; another arm 50 of the support 37 extends perpendicularly to the direction of the push-button rods and engages against a knife-edge bearing 38a, situated on a rear wall 38 of the box 35. This rear wall 38 is situated at that side of the box 35 which is remote from the push-buttons 1 and 3. The free end of the arm 39 of the L-shaped support 37 which extends in the longitudinal direction of the push-button rods 5 and 7 carries a head-like control member 40. This head-like control member 40 comprises front guide faces 41 and rear guide faces 42. The front guide faces 41 diverge and the rear guide faces 42 converge in the direction of inward movement of the push-button rods 5 and 6. Between these guide faces the head-like control member 40 is formed. Edges 44 extend towards the front end 45 in the direction of movement and adjoin the front guide faces 41. A short longitudinal slot 46 is formed in the head-like control member 40 and extends in the direction of movement, starting from a head side 45. The head 47 of a spring arm 48, which is moulded on the front wall 49 of the box 35, engages in this slot 46.

Fig. 2 shows the construction of Fig. 1 in a longitudinal sectional view of the box 35, so that the support 37 is shown in side view. In Fig. 2 it can be seen that the arm 39 of the support 37 extends in a substantially horizontal direction whilst the arm 50, which engages against the knife-edge bearing 38a, extends in a vertical direction. The arm 50 is formed with an opening 51 in which a nose 52 of a spring arm 53 engages. The spring arm 53 is connected to a plastics part 54, whose upper side 55 supports the arm 39. By means of two plastics strips 56 the plastics part 54 is connected to the front wall 49 of the box 35. The plastics part 54 and the strips 56 together with the outer walls of the box 35 constitute guides for the projections 36 of the push-button rods 5 and 7.

At the location of the head-like control member 40 recesses 58 are formed in the longitudinal walls

57 of the box 35, in which recesses the head-like control member 40 is engageable and which also form stops to limit the excursion of the arm 39.

5 The longitudinal walls 57 are connected to spring arms 57a which extend parallel to these walls and whose free ends are urged against the arm 50. The spring arm 48 and the spring arms 57a constitute positioning means which tend to urge the support 37 into its centre position (Fig. 1).

10 If in the embodiment shown in Figs. 1 and 2 one of the push-buttons, for example the push-button 1, is depressed the projection 36 of the push-button rod 5 abuts against a front guide face 41 of the arm 39 and presses the arm to the right. This enables the push-button 1 to be
15 pressed further inward. When the push-button rod 5 moves outward again its projection 36 presses the arm 39 again to the right via the rear guide face 42, enabling the push-button rod to move fully outward. After it has been pressed aside the arm 39 is always returned to its centre
20 position via the spring arms 48 and 57a. The same apparatus functions are obtained if the other push-button 3 presses the push-button rod 7 inward and this rod returns.

When the two push-buttons 1 and 3 are pressed together the two projections 36 move against the two front
25 guide faces 41. This inhibits a lateral excursion of the arm 39. Since the arm 39 is always in its centre position, engagement with the front guide faces 41 proceeds rapidly. When the push-buttons 1 and 3 are now pressed further inward the projections 36 press the rod 9 further
30 backwards via the arm 39 and the rear wall 38 of the box 35 in order to obtain the third function. When the push-buttons 1 and 3 are released the push-button rods 5 and 7 move outward again.

It may occur that the second push-button rod
35 is also pressed inward when a push-button rod has moved inward and its projection 36 engages behind the control member 40. Its projection 36 can also press the control member 40 aside again, so that both projections 36 then

engage behind the control member. In order to avoid jamming when the push-buttons return the projections are formed with bevelled edges 59. These bevelled edges 59 abut against the rear guide faces 42 and press the arm 39 upward. This upward movement is possible because the spring arm 53 can recede. When the two projections 36 have again reached the control member the spring arm 53 again presses the arm 50 against the knife-edge bearing 38a on the rear wall 38. Thus, the arm 39 is again pressed onto the upper edge 55 of the plastics part 54.

Mounting of the L-shaped support 37 is simplified in that the projection 52 on the spring arm 53 engages in the opening 51 and has such a shape that the arm 50, as it is pressed into the box 35, pushes the spring arm 53 away, causing the nose 52 to snap into the opening 51.

Claims:

1. A magnetic-tape-cassette apparatus comprising two push-buttons and associated function rods (5, 7) which, when the push-button rods (5, 7) are pressed inward over the length of an inward stroke, cause parts of the apparatus to perform separate functions, and comprising a third function rod (9) which when actuated causes a part of the apparatus to perform a further separate function and is provided with a control member (37, 40) which is arranged on a support (37) and relative to the direction of movement of the push-button rods is laterally movable in a first plane, a lateral movement of the control member (40) enabling the associated push-button rod to be moved by means of guide faces (41, 42), which are inclined relative to the direction of movement, each time that only one push-button rod is moved inward, whilst the guide faces (42) inhibit a lateral movement of the control member (40) when the two push-button rods (5, 7) are moved inward together, in such a manner that the third function can be performed, during which the control member can be moved inward with the push-button rods and the support (37) and the control member (40) are urged into a centre position by return means (48, 57a), characterized in that the control member (37, 40) is arranged to be movable perpendicularly to the first plane against the force of a spring (53) and in that the push-button rods (5, 7) exhibit bevelled edges (59) so that in the case that the movable control member (40) is laterally blocked the push-button rods can press said member away in a direction perpendicular to the first plane during the return movement.

2. A magnetic-tape-cassette apparatus as claimed in Claim 1, characterized in that a spring arm (48, 57a) urges the support (37) and the control member (40) into their centre positions.

3. A magnetic-tape-cassette apparatus as claimed in Claim 1, characterized in that the longitudinal walls (57) of the box (35) constitute stops to inhibit an



excessive excursion of the arm (39) carrying the control member (40).

4. A magnetic-tape-cassette apparatus as claimed in Claim 1, characterized in that the support (37) the support (37) carrying the control member (40) is arranged in a box (35) in whose interior the projections (36) of the push-button rods (5, 7), which projections have bevelled edges (59), are guided between outer walls of the box and guide strips (56).

5. A magnetic-tape-cassette apparatus as claimed in Claim 1 or 4, characterized in that the rear wall (38) of the box (35) is provided with a knife-edge bearing (38a) for the support (37) of the control member (40) and return means (48, 57a) which urge the support (37) into its centre position, which is oriented in the direction of inward movement.

6. A magnetic-tape-cassette apparatus as claimed in Claim 2, characterized in that a spring arm (48), which is arranged on the front wall (49), acts upon the control member (40) and in its centre position extends in the direction of inward movement.