

Recording and/or reproducing apparatus

The invention relates to a recording and/or reproducing apparatus for a magnetisable record carrier in the form of a tape which can be wrapped along a helical path over at least a part of the circumferential surface of a cylindrical scanning unit arranged on an electrically conductive chassis, which unit comprises at least one

5 rotatable magnetic head which cooperates with an amplifier *via* a shielded cable, which amplifier is accommodated in an electrically conductive shielding box comprising a bottom section and a cover section, said unit being surrounded by a cuff-like shielding means formed by the chassis and strip-shaped electrically conductive walls. The magnetic head, the amplifier as well as the cable extending between them are very

10 sensitive to spurious radiation in the form of electro magnetic fields because electric signals of comparatively low amplitude are processed in this electrical part of the apparatus. In commercially available apparatuses it is known to shield the relevant parts of the apparatus from such spurious radiation by arranging the scanning unit inside a cuff-like shielding means and to accommodate the amplifier in a separate shielding box

15 arranged adjacent the scanning unit on the chassis, a shielded cable being employed for the electrical connection between the scanning unit and the shielding box. Such a construction occupies comparatively much space and is also relatively intricate as a result of the two separate shieldings, whilst in addition the cable between the scanning unit and the amplifier is comparatively long and is therefore sensitive to spurious signals

20 despite its shielding.

It is the object of the invention to shield the scanning unit and the amplifier by means of a construction which is as compact and simple as possible. According to the invention, in order to achieve this in an apparatus of the type defined in the opening sentence, the shielding box for the amplifier and the cuff-like shielding

25 means for the scanning unit are combined to form a constructional unit in which one wall of the shielding box and one wall of the cuff-like shielding means are formed by a common wall portion. Thus, it is achieved that the two parts to be shielded, *i.e.* the

scanning unit and the amplifier, are situated close to each other and the entire shielding for both parts is of a simple and cheap construction owing to the double use of one wall portion.

It is found to be very advantageous if the common wall portion is
5 disposed near the free end wall of the scanning unit which is remote from the chassis and extends substantially parallel to said end wall of the scanning unit. In this way the frequently unused space bordering the free end wall of the scanning unit may be employed to accommodate the amplifier, which results in a very compact construction.

In this respect it is also found to be advantageous if the common wall
10 portion is pivotably arranged on an adjoining wall of the cuff-like shielding means. In this way it is simple to gain access to the scanning unit, for example for adjustment operations during assembly of the apparatus, without the amplifier and its shielding forming an obstruction.

Moreover, it is found to be advantageous if the common wall portion is
15 formed with an opening situated axially opposite the scanning unit, which opening allows the passage of at least the free end portion of the shaft by means of which the magnetic head can be rotated, and an electrically conductive blade spring is arranged on and has an electrically conductive connection with that side of the common wall portion which is remote from the scanning unit near the opening in said wall portion, the free
20 end of said spring being in resilient contact with the free end of the shaft. This results in a very compact construction because the shielding can be situated in the direct vicinity of the free end wall of the scanning unit, whilst it is also possible to establish an additional electrically conductive connection with the scanning unit in order to preclude the occurrence of electrostatic charges in known manner.

For a simple construction it is also found to be advantageous if the
25 amplifier is arranged on that side of the common wall portion which is remote from the scanning unit, said common wall portion being constructed as the bottom section of the shielding box on which its cover section can be placed. In this way it is achieved that the amplifier is readily accessible.

Furthermore, it is found to be advantageous if a wall of the cuff-like
30 shielding means, which wall adjoins the common wall portion, is formed with a duct which extends substantially parallel to the scanning unit, the shielded cable *via* which the magnetic head cooperates with the amplifier being passed through said duct. Thus,

an additional shielding for the shielded cable and hence a further reduction of its susceptibility to spurious radiation is obtained in a simple manner.

An embodiment of the invention will now be described in more detail, by way of example, with reference to the accompanying drawing.

5 Fig. 1 is a partly sectional side view of a shielded scanning unit and a shielded amplifier of a recording and/or reproducing apparatus.

Fig. 2 shows a part of the scanning unit and the amplifier shown in Fig. 1, a part of the shielding being in a hinged-up position.

Fig. 3 is a sectional view taken on the line III-III in Fig. 1.

10 Fig. 4 is a sectional view taken on the line IV-IV in Figures 1 and 2.

In Fig. 1 the chassis of a recording and/or reproducing apparatus for a magnetisable record carrier in the form of a tape bears the reference numeral 1, which chassis is made of an electrically conductive material. This chassis 1 carries a hollow cylindrical support 2, which is made of for example a plastics, a cylindrical scanning unit 5, which is inclined relative to the chassis 1 in the customary manner, being
15 secured to this support by means of brackets 3 and 4. This scanning unit 5 comprises a stationary drum section 6 and a coaxial rotatably drivable drum section 7, between which drum sections a gap is formed, at the location of which gap for example two diametrically opposed magnetic heads 8 and 9 are arranged on the drum section 7. The
20 motor for driving the drum section 7 may be accommodated in the stationary drum section 6 or may be secured to this drum section. A magnetisable record carrier 10 in the form of a tape can be wrapped along a helical path over at least a part of the circumferential surface of the scanning unit 5, as is indicated in dash-dot lines. In known manner useful electric signals, for example video signals, can be recorded on or
25 reproduced from the record carrier 10 in inclined tracks. For this purpose the magnetic heads 8 and 9 are connected to an amplifier 12 via a cable 11. The magnetic heads 8 and 9, the amplifier 12 as well as the cable 11 between them are very sensitive to spurious radiation in the form of electromagnetic fields, because electric signals of comparatively low amplitude are processed in this electrical part of the apparatus. In
30 order to shield the relevant parts of the apparatus from such spurious radiation the scanning unit 5 is provided with a cuff-like shielding means 13 in known manner and the amplifier 12 is accommodated in a shielding box 14, a shielded cable 11 being employed for the connection between these two parts. The shielding box 14 comprises a

tray-like bottom section 15 which can be closed by means of a detachable cover section 16.

In order to shield the scanning unit 5 and the amplifier 12 by means of compact and simple construction the shielding box 14 for the amplifier 12 and the cuff-like shielding means 13 for the scanning unit 5 are combined to form a constructional unit in which one wall of the shielding box and one wall of the cuff-like shielding means are combined to form a common wall portion. As can be seen in Fig. 1, the common wall portion in the present embodiment comprises the strip-shaped bottom wall 17 of the tray-like bottom section 15, which thus also constitutes a wall of the cuff-like shielding means 13. The shielding box 14 is arranged near that free end wall of the scanning unit 5 which is remote from the chassis 1, its bottom wall 17 extending substantially parallel to said end wall of the scanning unit 5, which results in an effective use of the available space. To complete the cuff-like shielding means 13 the chassis 1 comprises a strip-shaped wall portion 19 which is offset from its base plate 18, a separate strip-shaped wall 20, which extends substantially parallel to the wall 19, being connected to the base plate 18 of the chassis 1. These walls 19 and 20 carry the shielding box 14. In this way the base plate 18 of the chassis 1, its offset wall portion 19, the bottom wall 17 of the shielding box 14 and the wall 20 surround the scanning unit 5 to form the cuff-like shielding means 13 for this unit.

In the present embodiment the shielding box 14 is connected to the strip-shaped walls 19 and 20 in such a way that the shielding box 14 can be hinged up to give access to the scanning unit 5, which is for example advantageous during assembly of the apparatus in view of adjustments to the scanning unit 5.

For this purpose the bottom section 15 carries an outwardly projecting strip 21 near the wall 20, which strip is formed with a plurality of slits 22 which extend parallel to the wall 20 and which are situated in line with each other. The wall 20 comprises bent tabs 23 corresponding to these slits 22 in such a way that the shielding box 14 can be mounted by engagement of the tabs 23 in the slits 22. In this way the shielding box 14 or only its bottom section 15 can be swung up, as is shown in Figure 2. If the shielding box 14 is swung down towards the scanning unit 5, it can be latched in this position. This can be effected, for example, by twisting the tabs 23 and by means of a screw connection 24 between the wall 19 and the bottom section 15 of the shielding box 14. Obviously, such a hinged connection and latching can also be obtained

by means of other techniques, known *per se*. In order to ensure that the shielding box 14 is not open at the location where the strip 21 projects from the bottom section 15 the cover section 16 comprises a bent wall portion 25 to replace the missing side wall of the bottom section 15. The cover section 16 is detachably secured to the bottom section 15 in a customary manner by means of a series of tabs 26 which engage slightly resiliently around the bottom section 15. In order to establish a connection between the cover section 16 and the chassis 1 this section comprises a limb 27 whose free end carries two bent tabs 28 between which a straight tab 29 is interposed, which tabs alternately engage with different sides of an offset strip 30 on the base plate 18 of the chassis 1, as can be seen in Figure 3. The amplifier 12 is arranged on that side of the common wall portion which is remote from the scanning unit 5, *i.e.* on the bottom wall 17 of the tray-shaped bottom section 15, so that it is readily accessible after removal of the cover section 16.

As a result of such a double use of one wall portion for both shielding means it is also achieved that the two parts to be shielded, namely the scanning unit 5 and the amplifier 12, are situated close to each other. This has the advantage not only that the shielding means are of a simple construction but also that the electrical connection formed by the shielded cable 11 between the scanning unit 5 and the amplifier 12 can be very short, so that it is less susceptible to interference. For the same reason the wall 20 in the present embodiment is formed with a duct 31 which extends substantially parallel to the scanning unit 5, and through which the shielded cable 11 is led, so that it is additionally shielded from spurious radiation. As is apparent in particular from Fig. 4, such a duct 31 can be formed simply by several times bending a portion of the wall 20.

As is shown in Fig. 1, the common wall portion constituted by the bottom wall 17 is formed with an opening 32, which is situated axially opposite the scanning unit 5, for the passage of the free end of a shaft 33 by means of which the drum section 7 carrying the magnetic heads 8 and 9 can be driven. Further, an electrically conductive blade spring 34 is arranged on and is electrically connected to that side of the bottom section 17 which constitutes the common wall portion and is remote from the scanning unit 5 near the opening 32 in said bottom section, the free end of this spring being in resilient contact with the free end of the shaft 33. This results in a very compact construction because the bottom wall 17 which constitutes the

common wall portion can extend in the direct proximity of the free end wall of the scanning unit 5. Moreover, the conductive connection with the free end of the shaft 33 of the scanning unit 5 by means of the blade spring 34 can be obtained in a very simple and reliable manner. In known manner such a connection precludes the build-up of electrostatic charges on the rotatable drum section 7 of the scanning unit 5. In order to prevent the stationary drum section 6 of the scanning unit 5 from being charged electrostatically the bracket 4 which secures the scanning unit 5 to the support 2 is prolonged towards the chassis 1 and is secured to this chassis together with the wall 20 by means of a screw connection 35.

Obviously, a series of modifications to the above embodiments are possible without departing from the scope of the invention. For example, instead of the wall 19 which is offset from the base plate 18 of the chassis 1 there may be provided a separate wall similar to the wall 20. Furthermore, the shielding box 14 may also be arranged adjacent the scanning unit 5, instead of the wall 19 or 20, in which case a separate wall opposite the free end wall of the scanning unit 5 completes the cuff-like shielding means for the scanning unit 5. Moreover, the cover section 16 of the shielding box 14 may constitute the wall portion which is common to both shielding means, in which case the bottom section 15 accommodating the amplifier 12 is removable from the cover section 16. An essential feature is that the shielding box 14 for the amplifier 12 and the cuff-like shielding means 13 for the scanning unit 5 are combined to form a constructional unit in which one wall of the shielding box and one wall of the cuff-like shielding means are combined to form a common wall portion.

CLAIMS:

1. A recording and/or reproducing apparatus for a magnetisable record carrier (10) in the form of a tape which can be wrapped along a helical path over at least a part of the circumferential surface of a cylindrical scanning unit (5) arranged on an electrically conductive chassis (1), which unit comprises at least one rotatable
5 magnetic head (8,9) which cooperates with an amplifier (12) *via* a shielded cable (11), which amplifier is accommodated in an electrically conductive shielding box (14) comprising a bottom section and a cover section (15, 16), said unit being surrounded by a cuff-like shielding means (13) formed by the chassis (1) and strip-shaped electrically
10 conductive walls, characterised in that the shielding box (14) for the amplifier (12) and the cuff-like shielding means (13) for the scanning unit (5) are combined to form a constructional unit in which one wall of the shielding box (14) and one wall of the cuff-like shielding means (13) are formed by a common wall portion (17).
2. An apparatus as claimed in Claim 1, characterised in that the common wall portion (17) is disposed near the free end wall of the scanning unit which is remote
15 from the chassis (1) and extends substantially parallel to said end wall of the scanning unit (5).
3. An apparatus as claimed in Claim 2, characterised in that the common wall portion (17) is pivotably arranged on an adjoining wall (20) of the cuff-like shielding means (13).
- 20 4. An apparatus as claimed in Claim 2 or 3, characterised in that the common wall portion is formed with an opening (32) situated axially opposite the scanning unit (5), which opening allows the passage of at least the free end portion of the shaft (33) by means of which the magnetic head (8, 9) can be rotated, and an electrically conductive blade spring is arranged on and has an electrically conductive
25 connection with that side of the common wall portion (17) which is remote from the scanning unit (5) near the opening (32) in said wall portion, the free end of said spring being in resilient contact with the free end of the shaft (33).
5. An apparatus as claimed in any one of the Claims 2 to 4, characterised in



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that the amplifier (12) is arranged on that side of the common wall portion (17) which is remote from the scanning unit (5), said common wall portion (17) being constructed as the bottom section of the shielding box (14) on which its cover section (16) can be placed.

- 5 6. An apparatus as claimed in any one of Claims 2 to 5, characterised in that a wall (20) of the cuff-like shielding means, which wall adjoins the common wall portion (17), is formed with a duct (31) which extends substantially parallel to the scanning unit, the shielded cable (11) *via* which the magnetic head (8, 9) cooperates with the amplifier (12) being passed through said duct.

