

PATENT SPECIFICATION

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(54) CHASSIS FOR RECORDING AND/OR PLAYBACK APPARATUS

(71) We, N.V. PHILIPS' GLOEILAMPEN-FABRIEKEN, a limited liability Company, organised and established under the laws of the Kingdom of the Netherlands, of Emma-singel 29, Eindhoven, the Netherlands, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement.—

The invention relates to a chassis for a recording and/or playback apparatus, more particularly a chassis of the kind comprising a main part and an additional part or parts connected thereto. This construction enables different requirements of different recording chassis to be cheaply produced to meet the and/or playback apparatus. The main chassis part can carry components which are common to all the apparatuses, and the additional part or parts can carry a component or components to suit the specific needs of an individual apparatus. This is cheaper than making a separate unitary chassis for each apparatus.

A common method of attaching the additional part or parts of the chassis to the main part is by pin-and-hole connections. These connections may also serve for accurately positioning the additional chassis part or parts relative to the main part.

According to the invention there is provided a chassis for a recording and/or playback apparatus, comprising a main part and an additional part which is connected to the main part by at least one pin-and-hole connection comprising a pin formed on one part and a hole formed in the other part to receive the pin, the pin having an axial dimension less than that of the hole and having an axial bore which opens out of the free end of the pin and into which is screwed a screw having a head with a diameter greater than that of the hole for engaging the surface of said part in which the hole is formed.

An embodiment of the invention will now be described in more detail with reference to the accompanying drawings, in which

Fig. 1 is a plan view of a chassis for recording and/or playback apparatus, which

chassis comprises a main part and additional parts connected thereto, one of the additional parts being connected to the main part by pin-and-hole connections according to an embodiment of the invention, and

Figs. 2, 3 and 4 are sectional views on an enlarged scale, taken on the lines II—II, III—III and IV—IV respectively in Fig. 1. Fig. 4 shows the pin-and-hole connections which are in accordance with the invention; the pin-and-hole connections shown in Figs. 2 and 3 are not in accordance with the invention.

Fig. 1 shows an essentially plate-shaped chassis for carrying the various components of an apparatus for recording and/or playing back signals on and/or from a magnetic tape. In practice such a chassis has a comparatively complex shape with steps, recesses, projections, reinforcement ridges and the like. Of the components which are commonly provided on such a chassis, only a drive motor 1, two reel discs 2 and 3 with reel spindles 4 and 5, a tape-drive capstan 6 and a pressure roller 7 for co-operation with this capstan are shown for the sake of simplicity. The pressure roller 7 is mounted on a movable support 8, which furthermore carries two magnetic heads 9 and 10. Also, four push-buttons 11, 12, 13 and 14 are provided for switching certain apparatus functions.

Chassis of the kind described earlier herein take different forms for different recording and/or playback apparatuses, depending on the requirements imposed thereon. The chassis shown in the drawings comprises a main part 15 which is common to the chassis of all the different recording and/or playback apparatuses under consideration, and additional parts 16, 17 and 18 which can be connected to the main part to form individual chassis for the various individual apparatuses. On the main part 15 are mounted the components, such as the components 1 to 14 in Fig. 1, which are common to all the different apparatuses, whilst the additional parts serve to carry those components which vary from apparatus to

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apparatus. As can be seen in Fig. 1, a printed circuit board 19, required for one specific apparatus, can be mounted on the additional part 16 using screws 20; on the additional part 17 an additional push-button 21 can be mounted for another apparatus; and on the additional part 18 a conventional counter 22 can be mounted for a further apparatus. It is obvious that for a specific apparatus also two or all three of the above additional parts can be mounted on the main part. In this way different chassis can be assembled from one main part and additional parts to be connected thereto, whilst the main part, whose construction is more intricate, can advantageously be manufactured in very large quantities and thus cheaply, and the relatively constructionally simple additional parts can therefore also be manufactured cheaply. For example, the chassis may be moulded from a plastics material. To obtain this chassis only one comparatively complicated, expensive mould is then required for manufacturing the main part of the chassis, whilst for manufacturing the additional parts only simple moulds are required.

For connecting each additional part of the chassis to the main part, pin-and-hole connections are provided between the main part 15 and each additional part 16, 17 and 18 respectively, which connections also define the position of each additional part relative to the main part.

As can be seen from Fig. 2, between the additional chassis part 16 and the main part 15 there are two pin-and-hole connections 23 and 24 of different rectangular cross-section, the pins 25 and 26 being formed on the additional part 16 and the holes 27 and 28 in the main part. Owing to the different cross-sections of the two pin-and-hole connections the additional part 16 can be mounted on the main part 15 in one specific relative position only. The pins are then glued in the holes.

The additional chassis part 17 is connected to the main part by two pin-and-hole connections 29 and 30 of equal circular cross-sections, the holes 31 and 32 being formed in the additional part 17 and the pins 33 and 34 being formed on the main part 15. The holes 31 and 32 are asymmetrically disposed in the additional part so that the additional part can again be mounted on the main part in one specific position only.

As is shown in Fig. 3, the pins 33 and 34 each have a widened head portion 35, 36 whose diameter is greater than that of the remaining portion of the pin, the head portions 35 and 36 being elastically deformable. For fitting the additional part 17 on the main part 15 the additional part 17 is positioned with the holes 31 and 32 located over

the head portions 35 and 36 of the pins 33 and 34 respectively, after which the additional part 17 is pressed onto the main part. The pins then penetrate into the holes under elastic deformation of the head portions of the pins until the holes snap behind the head portions. This snap-connection, which is constituted by the positioning means, secures the additional part 17 to the main part 15.

The additional chassis part 18 is connected to the main part 15 by two pin-and-hole connections 37 and 38 (Figs. 1 and 4) which are constructed in accordance with the invention. The additional part 18 itself has a shape such that it can be mounted on the main part in one specific position only. Of the pin-and-hole connections 37 and 38 the holes 39 are formed in the additional part 18 and the pins 40 are provided on the main part 15. Each pin 40 is shorter than the corresponding hole 39 and has an axial bore 42 which opens out of the free end 41 of the pin 40. After the assembly of the main part and the additional part a screw 43 is screwed into the axial bore 42 in each pin. The heads 44 of the screws 43 have a greater diameter than the holes 39 in the additional part 18 so that they will engage the surface of the part 18 and press this part against the main part 15 to secure it thereto. Pin-and-hole connections of this construction have the advantage that they provide a particularly rigid and stable yet readily detachable connection between the additional and main parts of the chassis.

WHAT WE CLAIM IS:—

1. A chassis for a recording and/or playback apparatus, comprising a main part and an additional part which is connected to the main part by at least one pin-and-hole connection comprising a pin formed on one part and a hole formed in the other part to receive the pin, the pin having an axial dimension less than that of the hole and having an axial bore which opens out of the free end of the pin and into which is screwed a screw having a head with a diameter greater than that of the hole for engaging the surface of said part in which the hole is formed.
2. A chassis for a recording and/or playback apparatus, substantially as herein described with reference to Fig. 4 of the accompanying drawings.

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apparatus. As can be seen in Fig. 1, a printed circuit board 19, required for one specific apparatus, can be mounted on the additional part 16 using screws 20; on the additional part 17 an additional push-button 21 can be mounted for another apparatus; and on the additional part 18 a conventional counter 22 can be mounted for a further apparatus. It is obvious that for a specific apparatus also two or all three of the above additional parts can be mounted on the main part. In this way different chassis can be assembled from one main part and additional parts to be connected thereto, whilst the main part, whose construction is more intricate, can advantageously be manufactured in very large quantities and thus cheaply, and the relatively constructionally simple additional parts can therefore also be manufactured cheaply. For example, the chassis may be moulded from a plastics material. To obtain this chassis only one comparatively complicated, expensive mould is then required for manufacturing the main part of the chassis, whilst for manufacturing the additional parts only simple moulds are required.

For connecting each additional part of the chassis to the main part, pin-and-hole connections are provided between the main part 15 and each additional part 16, 17 and 18 respectively, which connections also define the position of each additional part relative to the main part.

As can be seen from Fig. 2, between the additional chassis part 16 and the main part 15 there are two pin-and-hole connections 23 and 24 of different rectangular cross-section, the pins 25 and 26 being formed on the additional part 16 and the holes 27 and 28 in the main part. Owing to the different cross-sections of the two pin-and-hole connections the additional part 16 can be mounted on the main part 15 in one specific relative position only. The pins are then glued in the holes.

The additional chassis part 17 is connected to the main part by two pin-and-hole connections 29 and 30 of equal circular cross-sections, the holes 31 and 32 being formed in the additional part 17 and the pins 33 and 34 being formed on the main part 15. The holes 31 and 32 are asymmetrically disposed in the additional part so that the additional part can again be mounted on the main part in one specific position only.

As is shown in Fig. 3, the pins 33 and 34 each have a widened head portion 35, 36 whose diameter is greater than that of the remaining portion of the pin, the head portions 35 and 36 being elastically deformable. For fitting the additional part 17 on the main part 15 the additional part 17 is positioned with the holes 31 and 32 located over

the head portions 35 and 36 of the pins 33 and 34 respectively, after which the additional part 17 is pressed onto the main part. The pins then penetrate into the holes under elastic deformation of the head portions of the pins until the holes snap behind the head portions. This snap-connection, which is constituted by the positioning means, secures the additional part 17 to the main part 15.

The additional chassis part 18 is connected to the main part 15 by two pin-and-hole connections 37 and 38 (Figs. 1 and 4) which are constructed in accordance with the invention. The additional part 18 itself has a shape such that it can be mounted on the main part in one specific position only. Of the pin-and-hole connections 37 and 38 the holes 39 are formed in the additional part 18 and the pins 40 are provided on the main part 15. Each pin 40 is shorter than the corresponding hole 39 and has an axial bore 42 which opens out of the free end 41 of the pin 40. After the assembly of the main part and the additional part a screw 43 is screwed into the axial bore 42 in each pin. The heads 44 of the screws 43 have a greater diameter than the holes 39 in the additional part 18 so that they will engage the surface of the part 18 and press this part against the main part 15 to secure it thereto. Pin-and-hole connections of this construction have the advantage that they provide a particularly rigid and stable yet readily detachable connection between the additional and main parts of the chassis.

WHAT WE CLAIM IS:—

1. A chassis for a recording and/or playback apparatus, comprising a main part and an additional part which is connected to the main part by at least one pin-and-hole connection comprising a pin formed on one part and a hole formed in the other part to receive the pin, the pin having an axial dimension less than that of the hole and having an axial bore which opens out of the free end of the pin and into which is screwed a screw having a head with a diameter greater than that of the hole for engaging the surface of said part in which the hole is formed.
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