

SPECIFICATION Microfiche Reading Apparatus

This invention relates to a microfiche reading apparatus having a film display platform for accommodating microfiches, which film display platform is mounted on the apparatus by at least two guide rail devices so as to be displaceable in two co-ordinate directions.

German Gebrauchsmuster 67 35 429 describes an arrangement in which the film display platform is mounted detachably on a guide rail device, so that the platform can be easily removed from the device for cleaning purposes or during transport of the apparatus.

Such mounting of the film display platform is not suitable, however, in the case of reading apparatus intended to accommodate film display platforms of different sizes, whereby, depending in each case on the size of the microfiche to be viewed, the user can attach the most suitable film display platform to the apparatus. In the case of the above-mentioned Gebrauchsmuster, the fixed guidance device would have to be designed for the largest film display platform contemplated and, as a result, when using a small film display platform, both the appearance and the operation of the apparatus would be adversely affected, and the manufacturing costs could be unnecessarily high.

The present invention provides a microfiche reading apparatus having a film-display platform which is mounted on the apparatus by at least two guide rail devices so as to be displaceable in two co-ordinate directions, there being a first guide rail device which has a stationary rail secured to the apparatus and having a guide element displaceable thereon, and a second guide rail device having a guide rail which is releasably fixed in relation to the guide element of the first guide rail device and a guide element which is displaceable along the rail of the second guide rail device and has the film-display platform mounted thereon.

The invention facilitates removal of the film-display platform for the purpose of cleaning, repair or exchange. In an especially important form of apparatus according to the invention, there is provided means for releasably retaining the second guide rail device (on which the film-display platform is mounted) which is such that the said device can be exchange for another such device of a different length. Advantageously, the apparatus can be used with any of a plurality of such devices, each of a different length.

In this way, each film display platform can be provided with a guide rail matched in length to the particular width of the film display platform. The user who needs merely the smallest film display platform does not, therefore, have to purchase a relatively very long guide rail such as is necessary, for example, when using a double display platform. Additionally, the visually unattractive appearance produced by a long guide rail and a narrow display platform can be avoided.

Advantageously, there is provided a support

plate for the film display platform, the plate being carried on the displaceable guide element of the first guide rail device. The guide rail of the second guide rail device is then preferably releasably mounted on the support plate.

For locating the second guide rail on the support plate, there may be provided at least two locking pins which engage releasably in corresponding apertures in the support plate.

The guide rail may be releasably secured to the support plate by magnetic action. Instead, however, where locking pins are provided, each may be releasably retained in a resiliently flexible surround element in the corresponding aperture, or each locking pin may engage the corresponding aperture in the manner of a press stud.

Each of the guide rail devices advantageously comprises a ball-bearing retainer guide, having a ball bearing arrangement between the guide rail and the displaceable guide element.

In accordance with a further preferred feature of the invention, the guide rail devices have stops limiting the displacement travel of the movable elements. The operation of the apparatus is then considerably simplified, because unintentional lateral displacement of the display platform beyond the scanning range of the projection lens cannot occur. This is especially important when, as is customary with many of the apparatuses on the market, the projection lens lies resiliently (as a so-called "floating lens") on a transparent cover plate on the film display platform.

The invention also provides a microfiche reading apparatus having a film display platform, displaceable in two co-ordinate directions, for accommodating microfiches, which film display platform is joined to the lower part of the apparatus by at least two guide rails running at right angles to one another, wherein there is provided at least one guide rail which is displaceable in a first co-ordinate direction and is secured to the lower part of the apparatus, and at least one other guide rail which is displaceable in a second co-ordinate direction and is secured to the film display platform, and the first and the second guide rails are releasably connected.

Microfiche reading apparatus according to the invention, and several different ways of achieving the releasable connection provided in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a partly-schematic perspective view of the lower part of the apparatus including the film-display platform; and

Figures 2 to 4 are cross-sections through film-display platforms showing in each case a different form of releasable connection between the guide rail thereof and a support plate.

Referring to Figure 1 of the accompanying drawings, the lower part of the apparatus is indicated generally by the reference numeral 1. Figure 1 also shows an illuminating device 19 for the microfiche and a projection lens 18 but, in the

interests of clarity, the remainder of the optical projection system (mirror system, projection surface) is not shown.

A guide device, indicated generally by the reference numeral 3, is secured on the upper surface 2 of the lower part 1 of the apparatus. The guide device 3 comprises a stationary rail 4 which is fixed to the apparatus and a movable rail 6 guided on ball bearings on the stationary rail. A support plate 7 is secured to the movable rail 6 and, on its side opposite the guide rail 3, the plate 7 is bent downwards to form an angled flange 7a which supports that side of the plate on the surface 2. To reduce the frictional forces between the flange and the top surface 2, the flange 7a may additionally be provided with sliding runners or rollers.

Parallel to the front edge of the support plate 7 (as seen in Figure 1), at right angles to the guide device 3, there is arranged a guide device 8 which is of the same design as the guide device 3, that is to say, it comprises a stationary rail 9 fixed to the support plate 7, a movable rail 10 and ball bearings 11 together with a ball bearing retainer 12 (see Figure 2). To the movable rail 10 there is secured a film display platform indicated generally by the reference numeral 13. The platform 13 comprises a frame 14 having transparent plates 15, 16 held therein, between which the microfiche to be viewed can be inserted. On the rear side of the frame 14 there is arranged a strip 5, which supports the display platform on the support plate 7. Whereas the lower transparent plate 16 is fixed in the display platform frame 14, the upper transparent plate 15 is mounted on the frame 14 so as to be pivotable about the axis 17, so that the upper plate can be opened up to enable a microfiche to be inserted.

The projection lens 18 is advantageously a so-called floating lens which is pressed resiliently against the upper transparent plate 15 and, in this way, regardless of slight irregularities in the movement of the display platform, a constant distance between the lens and the microfiche is ensured. A suitable mounting for such a floating lens is described, for example, in German Offenlegungsschrift P 26 32 934.

The reference numeral 19 denotes the illuminating device for the microfiche, and the reference numeral 7c denotes an aperture in the support plate 7 through which the microfiche is illuminated by rays from the device 19.

As a result of the possibilities provided by the guide devices 3 and 8 for displacing the support plate 7 in the direction of the arrows A and B (Figure 1) and for displacing the film display platform relative to the support plate in the direction of the arrows C and D, the film display platform can be displaced as desired in each of the two co-ordinate directions so that any desired micro-image on the microfiche placed between the transparent plates 15, 16 can be brought into the projectionary path 20.

To prevent the film display platform from being pulled away completely from beneath the lens 18

during lateral displacement of the platform in the direction C—D (which would result in the lens dropping down owing to its resilient mounting, so that the display platform could then no longer be readily pushed beneath the lens) the guide device 8 has limit stops which define the permissible limits for the range of movement of the display platform relative to the support plate 7. For this purpose, stop flanges 9a and 10a are provided on each end of the stationary rail 9 and the movable rail 10, respectively. The ball bearing retainer 12 abuts against the stop flanges with its regions 12a and 12b, respectively, depending on the particular end position of the movable rail. Similar stop flanges 4a and 6a are provided in the guide device 3.

To enable the display platform 13 to be exchanged for a display platform of larger or smaller format, the guide device 8 is mounted releasably on the support plate 7. For this purpose, the support plate 7 is provided with a plurality of bores 7b which co-operate with complementary pins 21 arranged on the underside of the stationary rail 9, so that the film display platform 13 is fixed in a simple manner in its desired position. To change the display platform, it is merely lifted so that the pins 21 disengage from the bores 7b. A display platform of larger or smaller format can then be placed with its pins 21 in the corresponding bores 7b on the support plate 7; the length of the guide rail device being matched to the particular width of the film-display platform. This ensures that for each display platform the appropriate stop is immediately present.

Figures 2 to 4 illustrate several possibilities for mounting the guide rail device 8 on the support plate 7. In Figure 2, a self-adhesive magnetic strip 22 corresponding in length to the stationary rail 9 is stuck to the underside of that rail; the magnetic strip 22 retains the support plate 7 which is manufactured from magnetically attracted material, for example, sheet iron. The pins 21 serve in this case merely to fix the position of the film-display platform on the support plate. The tapering shape of the lower end portions of the pins 21 facilitates the positioning of the display platform on the support plate.

In Figure 3 each bore 7b is fitted with a rubber surround element 23 which ensures that tolerances are accommodated and that the pin 21 has a firm seat on the support plate 7. The support plate 7 can in this case be manufactured from plastics material.

In Figure 4, instead of the pins 21, locking elements 24 are used which co-operate with the corresponding bore 7b in the manner of a snap-fastener or press stud.

Claims

1. A microfiche reading apparatus having a film-display platform which is mounted on the apparatus by at least two guide rail devices so as to be displaceable in two co-ordinate directions, there being a first guide rail device which has a



interests of clarity, the remainder of the optical projection system (mirror system, projection surface) is not shown.

A guide device, indicated generally by the reference numeral 3, is secured on the upper surface 2 of the lower part 1 of the apparatus. The guide device 3 comprises a stationary rail 4 which is fixed to the apparatus and a movable rail 6 guided on ball bearings on the stationary rail. A support plate 7 is secured to the movable rail 6 and, on its side opposite the guide rail 3, the plate 7 is bent downwards to form an angled flange 7a which supports that side of the plate on the surface 2. To reduce the frictional forces between the flange and the top surface 2, the flange 7a may additionally be provided with sliding runners or rollers.

Parallel to the front edge of the support plate 7 (as seen in Figure 1), at right angles to the guide device 3, there is arranged a guide device 8 which is of the same design as the guide device 3, that is to say, it comprises a stationary rail 9 fixed to the support plate 7, a movable rail 10 and ball bearings 11 together with a ball bearing retainer 12 (see Figure 2). To the movable rail 10 there is secured a film display platform indicated generally by the reference numeral 13. The platform 13 comprises a frame 14 having transparent plates 15, 16 held therein, between which the microfiche to be viewed can be inserted. On the rear side of the frame 14 there is arranged a strip 5, which supports the display platform on the support plate 7. Whereas the lower transparent plate 16 is fixed in the display platform frame 14, the upper transparent plate 15 is mounted on the frame 14 so as to be pivotable about the axis 17, so that the upper plate can be opened up to enable a microfiche to be inserted.

The projection lens 18 is advantageously a so-called floating lens which is pressed resiliently against the upper transparent plate 15 and, in this way, regardless of slight irregularities in the movement of the display platform, a constant distance between the lens and the microfiche is ensured. A suitable mounting for such a floating lens is described, for example, in German Offenlegungsschrift P 26 32 934.

The reference numeral 19 denotes the illuminating device for the microfiche, and the reference numeral 7c denotes an aperture in the support plate 7 through which the microfiche is illuminated by rays from the device 19.

As a result of the possibilities provided by the guide devices 3 and 8 for displacing the support plate 7 in the direction of the arrows A and B (Figure 1) and for displacing the film display platform relative to the support plate in the direction of the arrows C and D, the film display platform can be displaced as desired in each of the two co-ordinate directions so that any desired micro-image on the microfiche placed between the transparent plates 15, 16 can be brought into the projectionary path 20.

To prevent the film display platform from being pulled away completely from beneath the lens 18

during lateral displacement of the platform in the direction C—D (which would result in the lens dropping down owing to its resilient mounting, so that the display platform could then no longer be readily pushed beneath the lens) the guide device 8 has limit stops which define the permissible limits for the range of movement of the display platform relative to the support plate 7. For this purpose, stop flanges 9a and 10a are provided on each end of the stationary rail 9 and the movable rail 10, respectively. The ball bearing retainer 12 abuts against the stop flanges with its regions 12a and 12b, respectively, depending on the particular end position of the movable rail. Similar stop flanges 4a and 6a are provided in the guide device 3.

To enable the display platform 13 to be exchanged for a display platform of larger or smaller format, the guide device 8 is mounted releasably on the support plate 7. For this purpose, the support plate 7 is provided with a plurality of bores 7b which co-operate with complementary pins 21 arranged on the underside of the stationary rail 9, so that the film display platform 13 is fixed in a simple manner in its desired position. To change the display platform, it is merely lifted so that the pins 21 disengage from the bores 7b. A display platform of larger or smaller format can then be placed with its pins 21 in the corresponding bores 7b on the support plate 7, the length of the guide rail device being matched to the particular width of the film-display platform. This ensures that for each display platform the appropriate stop is immediately present.

Figures 2 to 4 illustrate several possibilities for mounting the guide rail device 8 on the support plate 7. In Figure 2, a self-adhesive magnetic strip 22 corresponding in length to the stationary rail 9 is stuck to the underside of that rail; the magnetic strip 22 retains the support plate 7 which is manufactured from magnetically attracted material, for example, sheet iron. The pins 21 serve in this case merely to fix the position of the film-display platform on the support plate. The tapering shape of the lower end portions of the pins 21 facilitates the positioning of the display platform on the support plate.

In Figure 3 each bore 7b is fitted with a rubber surround element 23 which ensures that tolerances are accommodated and that the pin 21 has a firm seat on the support plate 7. The support plate 7 can in this case be manufactured from plastics material.

In Figure 4, instead of the pins 21, locking elements 24 are used which co-operate with the corresponding bore 7b in the manner of a snap-fastener or press stud.

Claims

1. A microfiche reading apparatus having a film-display platform which is mounted on the apparatus by at least two guide rail devices so as to be displaceable in two co-ordinate directions, there being a first guide rail device which has a



15

stationary rail secured to the apparatus and having a guide element displaceable thereon, and a second guide rail device having a guide rail which is releasably fixed in relation to the guide element of the first guide rail device and a guide element which is displaceable along the rail of the second guide rail device and has the film-display platform mounted thereon.

2. Apparatus as claimed in claim 1, wherein the guide element of the first guide rail device carries a support plate for the film-display platform.

3. Apparatus as claimed in claim 2, wherein the guide rail of the second guide rail device is releasably mounted on the support plate.

4. Apparatus as claimed in claim 3, wherein the guide rail of the second guide rail device has at least two locking pins which engage releasably in corresponding apertures in the support plate.

5. Apparatus as claimed in claim 3 or claim 4, wherein the guide rail of the second guide rail device is releasably secured to the support plate by magnetic force.

6. Apparatus as claimed in claim 4, wherein

each of said apertures in the support plate has a resiliently flexible surround element for releasably retaining the corresponding pin.

7. Apparatus as claimed in claim 4, wherein each locking pin engages the corresponding aperture in the manner of a press stud.

8. Apparatus as claimed in any one of claims 1 to 7, wherein each of the guide rail devices has a ball bearing arrangement between the guide rail and the displaceable guide element.

9. Apparatus as claimed in any one of claims 1 to 8, wherein there is provided a stop for limiting the displacement of each guide element along the corresponding guide rail.

10. Apparatus as claimed in any one of claims 1 to 9, in which the second guide rail device can be exchanged for another such device of a different length.

11. A microfiche reading apparatus substantially as hereinbefore described with reference to, and as shown in, Figure 1 of the accompanying drawings, or in Figure 1 in conjunction with any one of Figures 2 to 4 thereof.