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COMPLETE SPECIFICATION.

An Improved Device for Viewing Cinematograph Film.

We, MARTIN LUCAS LIMITED, a British Company, of 151 Drury Lane, Hollinwood, in the County of Lancaster, 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 :—

This invention concerns an improved device for viewing cinematograph film in which film the pictorial or like matter is arranged in a plurality of rows of frames. Such frames have their sides transverse to the length of the film so that a portion of film has to be held so that its length is substantially horizontal if the frames are to be viewed in their correct upright disposition, and a number of frames are provided in each row to fill the width of the film, the top of one such frame lying adjacent the bottom of the next frame in the row, and so on, except for the end frames of each row which have respectively their tops and bottoms adjacent to and parallel with the edges of the film. A convenient number of such transverse rows are disposed side-by-side along the length of the film.

In one form of film, the frames of one transverse row may be used to depict an event, for example a man chopping wood, various frames of the row having slight differences in the disposition of the subjects so that viewing said frames rapidly in turn, will give the effect of animation thereof. The next transverse row may be used to depict a similar or different event, so that after the viewing of one transverse row, the film is displaced lengthwise so as to permit viewing of each next row.

In another form, the various frames of the transverse rows are not in any way related to one another, and in this case, the frames are views individually in a somewhat similar

manner to the projection of a magic lantern slide.

The known miniature cinematograph projectors for use with such films have mechanism for positively effecting the transverse scanning, that is to say for positively laterally moving and positioning the film relative to the projector in sequence in the several transverse positions, as by means of a multi-step cam. Whilst the idea of such positive movement and positioning is a legacy from the art of the cinematograph and undoubtedly provides the optimum results, the cost of such mechanism is not inconsiderable and the present invention is based upon an appreciation of the possibility of a more simple means for transverse scanning, primarily for use with a viewer, so as to obtain the required positioning with sufficient accuracy and dwell to give the effect of animation enough for its appreciation and enjoyment if not with quite the same perfection as that provided by positive mechanism as aforesaid.

According to the present invention, a device for viewing cinematograph film having a plurality of transverse rows of frames by viewing the frames either individually in turn, or in succession by rapidly viewing in turn the frames of an individual transverse row, comprises a film carrier slidably mounted for transverse movement relative to an optical system, and resilient detent means which serves to provide, under resilient pressure, a sufficiently defined step-by-step movement to result in a scanning effect when the viewer is used for rapidly viewing the frames of a transverse row and also serves positively to locate the film carrier relative to the film when the viewer is used for viewing individual frames.

The film carrier is preferably slotted to receive the film, which may be progressed longitudinally, and stop means may be

provided to limit the transverse movement of the film carrier.

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

Fig. 1 is a sectional elevation of the optical unit ;

Fig. 2 is an end elevation in the direction of arrow X of Fig. 1 ;

Fig. 3 is an end elevation in the direction of arrow Y of Fig. 1 ;

Fig. 4 is a front elevation of the film carrier ;

Fig. 5 is a sectional end elevation at 5—5 of Fig. 4 ;

Fig. 6 is a section at 6—6 of Fig. 4 ; and

Fig. 7 shows in perspective view the mode of operation of the device.

The viewer described with reference to the drawings comprises two main parts, a combined slide and film carrier 11 and an optical unit 12, both parts being mainly plastic mouldings. The slide part is thin and substantially square, measuring about 2 inches. Overhanging flanges 13 on opposite edges form a slide channel on one face. On the other face and centrally behind such channel and in line therewith is a shallow bridge-like frame portion 14, rebated on its outer face to hold a ground glass light-diffusing screen 15 which is permanently secured therein by deformation over its edges of the end portions of a small upstanding edge 16 provided in the initial moulding for that purpose. The side portions of such edge 16 protect the screen when the viewer is stood on a table or other surface.

In the centre of the base of the slide channel is a rectangular aperture 17 measuring about $1\frac{1}{2}$ inches lengthways of the channel by about $\frac{7}{16}$ inch wide.

The optical unit 12 is mainly tubular, having a rectangular base flange 18 at one end of the same thickness as the depth of the slide channel. The longitudinal edges of such flange 18 are rebated to provide thin edge portions 18a complementary to the overhanging flanges of the channel. A slit 19 is formed behind one of such thin edges 18a so that it becomes a spring-like element 20 integral at its ends with the rest of the base flange 18, such spring-like element 20 serving to urge the opposite edge 18a resiliently into engagement with its complementary flange 13 of the slide channel. In forming the rebate for such opposite edge 18a a small central projection 21 is provided to operate in the manner of a detent with complementary notches 22 formed in the edge of the complementary overhanging flange 13. The under face of the base flange 18 is formed with a shallow rectangular rebate to receive and hold a closure plate or mask 23 which is formed at its centre with a rectangular aperture 24 measuring about $\frac{1}{2}$ inch length-

ways of the slide by $\frac{3}{8}$ inch across to define the visible area of the film. On the outer face of the plate 23 and surrounding the said aperture 24 is a shallow upstanding flange 25 against which the film is intended to rest for defining focus relative to the optical system. Within the tubular portion of the optical unit 12 and about half-way in its length, is a partition 26 formed with a central hub-like portion 26a recessed on one face to receive a plastic lens 27 adapted to be secured in position by pressing over the edge 2 of the hub-like portion 26a while applying heat. During assembly, the optical unit 12 is permanently secured by its base flange 18 within the slide channel of the film carrier 11 by a deforming operation if necessary under applied heat the relative end positions of its movement in the slide being defined by abutment of the two sides of a raised surround 25 of the aperture 24 against the respective short sides of the aperture 17. Four notches 22 are formed in the edge of one overhanging flange 13 of the slide, so located as to define intermediate and end positions for a film having four rows of pictures. The two end notches are not essential but have been found useful in obviating "bounce" and the end of the transverse movement due to the side of surround 25 coming into sudden contact with a short side of aperture 17.

In use a film 29 to be viewed is placed in the slide so as to be under the bridge part 14 and against the outer face of the film carrier 11. The optical unit 12 is held by the fingers of one hand and the film carrier 11 reciprocated relative thereto by the fingers of the other hand (see Fig. 7). Such reciprocation gives the required scanning for the upper and lower pictures of the film 29 while the relatively resilient nature of the force producing such reciprocation results in momentary pauses at the intermediate positions as the central projection 21 bears suddenly on the side of the overhanging flange 13 after running free past a notch 22, which, though comparatively non-positive are in fact sufficiently defined to give an effect of scanning for the intermediate rows of pictures, at least sufficient for an appreciation of the animation thereby intended to be provided. The device therefore enables such a film to be viewed in its animated aspect, a result hitherto unobtainable without the use of a projector ; and such effect is obtained without the complication of mechanism for positive scanning hitherto considered indispensable for obtaining animation from such films.

What we claim is :—

1. A device for viewing cinematograph film, having a plurality of transverse rows of frames by viewing the frames either individually in turn, or in succession by



rapidly viewing in turn the frames of an individual transverse row, comprising a film carrier slidably mounted for transverse movement relative to an optical system, and resilient detent means which serves to provide, under resilient pressure, a sufficiently defined step-by-step movement to result in a scanning effect when the viewer is used for rapidly viewing the frames of a transverse row and also serves positively to locate the film carrier relative to the film when the viewer is used for viewing individual frames.

2. A device as claimed in Claim 1 in which the film carrier is slotted to receive the film, which is capable of being progressed longitudinally.

3. A device as claimed in Claim 1 or 2 in which stop means are provided to limit the transverse movement of the film carrier.

4. A device as claimed in any preceding claim in which said film carrier consists of a member having a slot transversely thereof, the sides of said slot being under-cut to form a slide channel, and having at the other side thereof a bridge piece opposite an aperture in the base of the slide channel, carrying a piece of translucent material, such as frosted glass, and forming a longitudinal slot through which film may be progressed, and in which said optical system is included in an optical unit, containing a lens, slidable in said slide channel and located therein by said resilient detent means, said lens being focussed, through an aperture in the optical unit of

such dimensions as to permit the viewing of one frame, onto the film as it is moved past the aperture by the carrier.

5. A device as claimed in Claim 4 in which the aperture in the base of the slide channel extends over the whole of any transverse row of frames when the film is positively located, transversely, on the slot formed by the bridge piece.

6. A device as claimed in Claim 5 in which the transverse movement of the carrier relative to the optical system is limited by stop means on said unit engaging with abutments on said carrier so that the aperture in the optical unit scans substantially exactly a transverse row of frames.

7. A device as claimed in any of the preceding Claims 4 to 6 in which said resilient detent means comprise a series of notches in one side of said slide channel and a projection on said optical unit adapted to be urged resiliently into contact with said side, whereby by sudden engagement therewith, said hesitation is caused.

8. A device for viewing cinematograph film of the kind referred to, constructed and arranged substantially as hereinbefore particularly described with reference to and as illustrated in the accompanying drawings.

For the Applicants:

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PROVISIONAL SPECIFICATION.

An Improved Device for Viewing Cinematograph Film.

We, MARTIN LUCAS LIMITED, a British Company, of 151 Drury Lane, Hollinwood, in the County of Lancaster, do hereby declare this invention to be described in the following statement:—

This invention relates to an improved device for viewing or projecting cinematograph film of the kind in which the pictorial or like matter is arranged on the film in a plurality of adjacent longitudinal rows. Such films are primarily intended to be used with a toy projector and the pictures of the several rows of pictures are either arranged to be scanned transversely so as to give the effect of animation while longitudinal movement serves to cause progression across the screen, or for presentation in longitudinal sequence, e.g. by moving first along one row then back along the next, forward again along the next and so on, with the effect of a long lantern slide but without animation.

The known miniature cinematograph projectors for use with such films have mechanism for positively effecting the transverse

scanning, that is to say for positively laterally moving and positioning the film relative to the projector in sequence in the several transverse positions, as by means of a multi-step cam. Whilst the idea of such positive movement and positioning is a legacy from the art of the cinematograph and undoubtedly provides the optimum results, the cost of such mechanism is not inconsiderable and the present invention is based upon an appreciation of the possibility of a more simple means for transverse scanning, primarily for use with a viewer, so as to obtain the required positioning with sufficient accuracy and dwell to give the effect of animation enough for its appreciation and enjoyment if not with quite the same perfection as that provided by positive mechanism as aforesaid.

According to the invention the film carrier is slidably mounted for transverse movement relative to the optical system and resilient detent means are provided to give positioning at least for each intermediate position,

whereby under resilient pressure a sufficiently defined step-by-step movement is obtained to give the required scanning effect.

In one example of the invention a viewer comprises two main parts, a combined slide and film holder and an optical unit, both parts being mainly plastic mouldings. The slide part is thin and substantially square, measuring about 2 inches. Overhanging flanges on opposite edges form a slide channel on one face. On the other face and centrally behind such channel and in line therewith is a shallow bridge-like frame portion, rebated on its outer face to hold a ground glass light-diffusing screen which is permanently secured therein by deformation over its edges of the end portions of a small upstanding edge provided in the initial moulding for that purpose. The side portions of such edge protect the screen when the viewer is stood on a table or other surface.

In the centre of the base of the slide channel is a rectangular aperture measuring about $1\frac{1}{2}$ inches lengthways of the channel by about $\frac{7}{16}$ inch wide.

The optical unit is mainly tubular, having a rectangular base flange at one end of the same thickness as the depth of the slide channel. The longitudinal edges of such flange are rebated to provide thin edge portions complementary to the overhanging flanges of the channel. A slit is formed behind one of such thin edges so that it becomes a spring-like element integral at its ends with the rest of the base flange, such spring serving to urge the other edge resiliently into engagement with its complementary flange of the slide channel. In forming the rebate for such other edge a small central projection is provided to operate in the manner of a detent with complementary notches formed in the edge of the complementary overhanging flange. The under face of the base flange is formed with a shallow rectangular rebate to receive and hold a closure plate or mask which is formed at its centre with a rectangular aperture measuring about $\frac{1}{2}$ inch lengthways of the slide by $\frac{3}{8}$ inch across to define the visible area of the film. On the outer face of the plate and surrounding the said aperture is a shallow upstanding flange against which the film is intended to rest for defining focus relative to the optical system. Within the tubular portion of the optical part and about half-way in its length, is a partition formed

with a central hub-like portion recessed on one face to receive a plastic lens adapted to be secured in position by pressing over the edge of the rebate while applying heat. During assembly, the optical unit is permanently secured by its base flange within the slide channel by a deforming operation under applied heat to produce suitable projection to define the relative end positions of its movement in the slide. Two notches are formed in the edge of the overhanging flange of the slide, so located as to define intermediate positions for a film having four rows of pictures.

In use a film to be viewed is placed in the slide so as to be under the bridge part and against the outer face of the slide part. The optical part is held by the fingers of one hand and the slide part reciprocated relative thereto by the fingers of the other hand. Such reciprocation gives the required scanning for the upper and lower pictures of the film while the relatively resilient nature of the force producing such reciprocation results in momentary pauses at the intermediate positions, which though comparatively non-positive are in fact sufficiently defined to give an effect of scanning for the intermediate rows of pictures, at least sufficient for an appreciation of the animation thereby intended to be provided. The device therefore enables such a film to be viewed in its animated aspect, a result hitherto unobtainable without the use of a projector; and such effect is obtained without the complication of mechanism for positive scanning hitherto considered indispensable for obtaining animation from such films.

In a modification the reciprocation could be obtained from a cam or crank with the inter-location of resilience to permit the detent feature to provide the momentary hesitation at the predetermined intermediate position or positions. By embodying a source of light in the optical system in place of the viewing lens and by providing a suitable stand, the device could be adapted to operate as a simple projector.

Dated this 2nd day of October, 1950.

For the Applicants:

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700,300 COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

