

# PATENT SPECIFICATION

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## (54) SLIDE PROJECTORS

(71) We, EASTMAN KODAK COMPANY, a Company organised under the Laws of the State of New Jersey, United States of America, of 343 State Street, Rochester, New York 14650, United States of America, 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 relates to slide projectors, and particularly to slide projectors in which slides after projection are directed in succession to form a stack of slides.

Slide projectors are known in which slides to be projected are stacked one on top of the other in a supply magazine or chamber and in which after projection the slides are automatically formed into another stack in a receiving or stacking chamber or magazine.

In such projectors, the magazine or stacking chamber is so dimensioned that it can only receive the maximum number of slides which are stacked in the supply magazine or chamber. If a supply magazine whose slides have all been projected is exchanged for a new one during a slide show, or if more slides than usual have been loaded in the supply chamber, and the operator has failed to exchange the full collecting magazine for an empty one, or to remove the projected slide stack from the stacking chamber, the danger exists of excess slides jamming the slide path after leaving the projection gate. The slide changer will then become blocked, and the slides may be damaged.

In accordance with the present invention there is provided a slide projector in which slides leaving the projector gate in succession are arranged to move along a predetermined path into a stacking chamber to form a stack of slides, wherein the stack is arranged to build up obliquely to the direction of the path along which each slide enters the stacking chamber and the

slides are arranged to join the upper end of the stack until the stack is of predetermined size whereupon the next slide to enter the stacking chamber is deflected to pass alongside the stack.

It is convenient to allow the slide moving into the stacking chamber to fall along a vertical path, and to guide the deflected slide along the upper edges of the slides in the stack.

A deflector operable by or in synchronism with a slide changing mechanism of the projector may move into a position in which it can deflect a slide which has entered the stacking chamber but not joined the stack.

A guideway may be provided for receiving a deflected slide and guiding it to an outlet from the stacking chamber. An ejecting mechanism driven by or in synchronism with a slide changing mechanism of the projector may eject a deflected slide from an outlet from the chamber.

The relevant parts of a slide projector incorporating the present invention will now be described by way of example with reference to the accompanying diagrammatic drawings in which:—

Figures 1 to 3 show sectional side views of the first embodiment of projector gate or slide stage, slide stacking chamber and slide directing means of the projector, at different stages of operation;

Figure 4 shows a sectional plan view of the stacking chamber;

Figure 5 shows a view similar to that of Figure 3 but of an alternative embodiment including a slide ejector mechanism; and

Figure 6 shows a sectional plan view of the stacking chamber and ejector mechanism of Figure 5.

The following description is confined to certain aspects of a slide projector. The construction of the remainder of the projector may take any suitable known form, and may in particular incorporate features described in the specification of Patent

[Price 25p]

Price 33p

Application No. 2818/72 (Serial No. 1,379,301).

Referring now to the drawings, the slide projector incorporates a chute 1 for guiding a slide vertically down from a supply magazine or chamber (not shown) to a projector gate 2 where it is supported on the optical axis 3 of the projector. The chute 1 continues below the projector gate to direct the slide, after projection, into a stacking chamber 4. The stacking chamber has a plane base wall 5 that is inclined to the horizontal and vertical during normal operation of the projector, and an end wall 6 extending perpendicularly to the base wall 5. As shown in Figure 4, the stacking chamber 4 is open at 7 at one side of the projector housing. In the embodiment shown in Figures 1, 2, 3 and 4, a shallow extension of the stacking chamber forming a guideway 8 is formed at the upper end of the end wall 6 and generally parallel to the base wall 5. This guideway has a curved bounding wall 9 and opens into a further outlet 10 at one side of the projector housing. The stacking chamber 4 is of suitable size to accommodate a trough-like slide collecting magazine 11 which can be inserted in or removed from the stacking chamber through the opening 7 in the projector housing.

Pivotaly mounted on a pin 12 at one side of the chute 1 is a deflector lever 13 having an actuating flange 14 disposed at one side of the chute above the projector gate and having a slide-engaging shoe 15 extending into the stacking chamber 4 below the chute. A slide changing mechanism (not shown) such as that disclosed in the specification of Patent Application 2818/72 (Serial No. 1,379,301) is incorporated, and this includes a pin 16 which is vertically reciprocable as a slide changing member moves through an operating cycle. A spring 17 is arranged to bias the flange 14 of the deflector lever 13 towards the pin but movement of the lever in the clockwise sense is limited by a stop 18. The only part of the deflector lever to project into the path of a slide is the shoe 15, and such projection can take place only at a particular stage of each slide changing cycle.

In operation, the first slide 30 from the supply magazine or chamber moves to the projection gate as a result of operation of the slide changing mechanism. Following projection of the slide image the slide is released from the projection gate, the slide changing member (not shown) and pin 16 moving in the direction A of Figure 1, and falls vertically from the chute 1 into the stacking chamber striking the end wall of the magazine 11 and laying parallel to this

wall (or the end wall 6 if the magazine is not present). The second slide 30 falls into the projection gate, and the slide changing member and pin 16 move upwardly in the direction B of Figure 2 in order to withdraw the third slide from the supply magazine or chamber during the next slide changing cycle. During its upward movement the pin 16 engages the flange 14 of the deflector lever which is thereby rocked to project the shoe 15 temporarily in the direction C into the slide path into the stacking chamber as shown in Figure 3. However, this projection occurs after the first slide has moved out of range of the shoe 15.

When the slide changing mechanism is operated after projection of the second slide this slide falls into the stacking chamber striking the upper face of the first slide and stacking itself alongside and parallel to the first slide. Further slides join the stack 32 in succession as the slide changing mechanism is operated, and Figure 1 shows several slides already in the stack. If, when the stack has attained a predetermined size, and preferably, although this is not shown, has reached the normal capacity of the slide magazine, and remains in this chamber, a further slide 31 is allowed to fall into the stacking chamber then this slide 31 will be arrested in an erect position, as shown in Figure 2, engaging the upper edge of the last slide 30 of the stack 32 and also the chute 1. In this position it would jam the slide path and prevent the subsequent slide from falling from the projector gate. However, actuation of the deflector lever 13 causes the shoe 15 to deflect the further slide 31 alongside the upper side of the stack, as indicated in Figure 3. This slide 31 slides along and is guided by the upper edges of the slides 30 into the guideway 8 and can fall out of the outlet 10. Jamming of slides moving into the stacking chamber is thereby avoided.

In the alternative embodiment of Figures 5 and 6, a slide 31 which has been deflected alongside the stack 32 of slides is arranged to be ejected from the stacking chamber by an ejector mechanism operable in synchronism with the slide changing mechanism of the projector. Referring to Figures 5 and 6, where parts similar to those of the first embodiment have been identified by the same reference numerals, the end wall 20 of the stacking chamber 4 does not lead into a guideway for a deflected slide 31 but is slotted at 21 together with part of an adjacent wall 22 of the stacking chamber so that the slide-engaging end 23 of an ejector lever 24 can extend therethrough. This ejector lever is pivoted at 25 and biased

by a spring 26 against an eccentric cam 27 driven by a motor 28 which also drives the slide changing mechanism. In operation of this alternative arrangement the ejector lever 24 is pivoted (anticlockwise as seen in Figure 6) by the motor 28 at a stage in each slide changing operation before the pin 16 moves downwards sufficiently to allow a slide in the projector gate to fall towards the stacking chamber 4. If a slide 31 is then resting alongside the stack the slide engaging end 23 of the ejector lever 24 engages an edge of this slide 31 and ejects it from the open side of the stacking chamber.

It will be appreciated that the mechanism described may be effective to prevent slide jamming whether or not a slide magazine is present in the stacking chamber.

#### WHAT WE CLAIM IS:—

1. A slide projector in which slides leaving the projector gate in succession are arranged to move along a predetermined path into a stacking chamber to form a stack of slides, wherein the stack is arranged to build up obliquely to the direction of the path along which each slide enters the stacking chamber and the slides are arranged to join the upper end of the stack until the stack is of predetermined size whereupon the next slide to enter the stacking chamber is deflected to pass alongside the stack.

2. A slide projector as claimed in claim 1, wherein a slide moving into the stacking chamber is arranged to fall along a vertical path, and wherein the deflected slide is guided by the upper edges of slides in the stack.

3. A slide projector as claimed in claim

1 or claim 2, including a deflector which is operable by or in synchronism with a slide changing mechanism of the projector to move into a position in which it can deflect a slide which has entered the stacking chamber but not joined the stack.

4. A slide projector as claimed in claim 3, wherein the deflector comprises a pivotally mounted lever which is operated by a member of the slide changing mechanism.

5. A slide projector as claimed in any preceding claim, including a guideway for receiving a slide which has been deflected alongside the stack and for guiding this slide to an outlet from the stacking chamber.

6. A slide projector as claimed in any preceding claim, including a mechanism driven by or in synchronism with a slide changing mechanism of the projector for ejecting from an outlet from the stacking chamber a slide which has been deflected alongside the stack.

7. A slide projector as claimed in claim 6, wherein the ejecting mechanism comprises a slide-engaging lever which is cam actuated by a motor arranged to drive the slide changing mechanism of the projector.

8. A slide projector as claimed in any preceding claim wherein the stacking chamber is arranged to support a removable slide magazine whose normal slide capacity is a stack of the said predetermined size.

9. A slide projector substantially as hereinbefore described with reference to Figures 1, 2, 3 and 4, or to Figures 5 and 6, of the accompanying drawings.

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2. A slide projector as claimed in claim 1, wherein a slide moving into the stacking chamber is arranged to fall along a vertical path, and wherein the deflected slide is guided by the upper edges of slides in the stack.

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