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PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) SLIDE STACK ADAPTER FOR USE WITH AN OPTICAL SLIDE PROJECTOR

(71) We, EASTMAN KODAK COMPANY, a Company organized 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:—

The present invention relates to a slide stack adapter for use with the optical slide projector described and claimed in our Letters Patent No. 1,040,701 and comprising a slide projection gate, means for detachably mounting a slide tray on top of the projector above the projection gate and optical axis for movement relative to the gate, indexing means for moving the slide tray successively to bring slides in the tray into register with the gate into which the slides are fed downwardly seriatim for projection and transport means for returning a slide to the slide tray, such projector hereinafter being referred to as "of the kind defined."

In accordance with the present invention there is provided a slide stack adapter for use with an optical slide projector of the kind defined, comprising a slide support member having a slide take-up unit, a slide supply unit for a stack of slides in side by side relation and having a spring for biasing the stack toward the slide take-up unit, the slide support member further defining a passage-way between the take-up and supply units, means on the slide support member for mounting the slide support member on the slide projector with the passageway in register with the gate, stop means for the stack of slides movable from a normal position across the passage-way into the slide take-up unit and back again, means for gripping a slide adjacent to the leading slide in the supply unit for holding the adjacent slide and remaining slides in the stack against the force exerted by the spring

and means interrelating the stop means and gripping means for operation in timed relation, the interrelating means further being responsive to the operation of the indexing means for causing the gripping means to grip the adjacent slide as the transporting means returns any slide from the gate through the passageway into the slide support member, and the stop means to be moved away from the leading slide so as to release said slide and to urge the returned slide into the take-up unit as the transporting means transports the released leading slide to the gate.

In the accompanying drawings:—

Fig. 1 is a perspective view of a combined slide stack adapter and projector constructed in accordance with the present invention;

Fig. 2 is a segmental plan, to an enlarged scale of the structure of Fig. 1 with portions thereof broken away;

Fig. 3 is a perspective view, to an enlarged scale, from the lower left hand corner of the slide stack adapter shown in Fig. 1 with portions of its housing broken away for purposes of clarity;

Fig. 4 is a side elevation partially in section of the opposite side of the slide adapter of Fig. 3;

Fig. 5 is a segmental side elevation partially in section taken on the line 5—5 of Fig. 2 and showing the projector in its normal slide projecting position;

Fig. 6 is a plan of Fig. 5;

Fig. 7 is a segmental side elevation similar to Fig. 5 but showing the projector with the projected slide returned to the channel;

Fig. 8 is a plan of Fig. 7;

Fig. 9 is a view similar to Fig. 7 showing the returned slide being forced into the slide take-up unit of the channel, and the first or leading slide in the supply unit released and ready for transport to the projecting position; and

Fig. 10 is a plan of Fig. 9.

Referring to the drawings, the top load stack

[Price 5s. 0d. (25p)]

slide adapter 12 is mounted on a projector 14 of the type disclosed in Specification No. 1,040,701, having incorporated therein a tray indexing mechanism of the type disclosed in our pending application No. 19621/65 (Serial No. 1,118,583). In a projector of this type, during a single cycle of operation of the projector from its normal slide projecting position, a projected slide 16, if any, is returned to a slide holding means, the slide holding means indexed, and a different slide lowered by a slide transport means 18 into the projecting position. A projector of this type is provided with an indexing pawl 20 of the indexing mechanism which is adapted to be moved between spaced indexing pins on a slide tray, and then moved angularly for advancing the tray. This indexing pawl 20 (see Fig. 2) and related indexing mechanism (not shown) provides the motive force for operating the top load stack slide adapter 12 which is mountable on the projector 14. Since the indexing and slide transporting mechanisms are described in the aforementioned patent specifications, they will not be described in further detail herein.

The top load stack slide adapter 12 comprises a generally U-shaped channel 22 (Figs. 1 and 2) mounted in a plastic moulded housing 24, and having a central opening 26 (Fig. 2) adapted to register with openings in housing 24 and a slide gate 28 (Fig. 5) of projector 14 when the adapter 12 is mounted thereon. To locate adapter 12 on projector 14, the housing 24 has a bore 30 at one end for receiving a complementary post 32 on projector 14 as seen in Fig. 2. In addition, the housing 24 has an opening 34 for receiving a pin 36 on projector 14, and further has a slot 38 along the lower front for receiving an inwardly extending rib 40 on a rim 42 of projector 14. These co-operating parts serve to hold the stack slide adapter 12 and housing 24 in a fixed position with the openings thereof in register with projection gate 28.

The channel 22 of slide adapter 12 provides a slide supply unit 44 (Fig. 2) on one side of opening 26 and a slide take-up unit 46 on the opposite side. A slide pressure plate 48 is pivotally mounted on a bracket 50 having a depending rib 52 (Fig. 3) slidably mounted in a slot 54 in a channel flange 56, and urged by a spring 58 in a direction for pressing a stack of slides 16 in supply unit 44 against a pair of stop shoes 60 (Fig. 2). Another similar bracket 62 is slidably mounted in a slot 64 of the opposite flange 66 of channel 22, and has a fixed plate 68 for urging slides 16 in take-up unit 46 against a pair of spring mounted, beveled slide retainers 70.

Each of the stop shoes 60 (Fig. 2) is integrally formed with a plate 72 (Fig. 3) guided for reciprocal movement along sides 74 and 84 of channel 22 (Fig. 2) by means of a pair of cooperating elongated slots 76 and pins 78

(Fig. 3). Each of the plates 72 is urged by a spring 80 toward the stack of slides 61.

The top load stack slide adapter 12 is provided with a slide gripper 82 (Fig. 4) for engaging one side of the second slide 16 in supply unit 44 and urging the slide into frictional engagement with the opposite side 84 of channel 22. The purpose of this is to releasably hold the second slide in its original position so that it and the remaining slides 16 in the stack will not be advanced by spring 58. Accordingly, the leading or front slide 16 can then be freed or released for transport without any interference from the remaining slides. The gripper 82 comprises a bracket 86 pivotal about bent ends 88 of a pair of spaced fingers 90 held into engagement with a side 74 of channel 22 by a pair of leaf springs 89. The bracket 86 has a lug 92 extending through an opening 94 in side 74 of channel 22, and a knife 96 secured to lug 92 for engaging the edge or side of a slide 16. The knife 96 of gripper 82 and stop shoes 60 are spaced along channel 22 one and a half slide thicknesses apart so that knife 96 will always engage the middle of the second slide in supply unit 44. To accommodate slides 16 of variable thicknesses, lug 92 and knife 96 may be mounted on a slider, not shown, provided with a calibrated index and a set screw for varying the position of knife 96 with respect to stop shoes 60 so that knife 96 may be properly positioned to accommodate slides 16 of any thickness. Naturally, once knife 96 is set to accommodate a slide of a predetermined thickness, all slides used must be of the same thickness.

The slide adapter 12 is further provided with a slide pusher lug 98 formed by a bracket 99 (Fig. 3) supported on the opposite side 84 of channel 22 for separating the first or leading slide 16 in supply stack 44 from the remaining slides, and for providing a stop for the second slide. The slide pusher bracket 99 is similar to gripper bracket 86 having a pair of spaced fingers 100 with bent ends 102 that are urged into engagement with side 84 of channel 22 by a pair of leaf springs 104 and about which pusher bracket 99 pivots. The pusher lug 98 extends through a slot 108 in side 84 and is spaced relative to the stop shoe 60 approximately a half slide thickness for engaging one edge of the first or leading slide abutting stop shoe 60, and extending in front of the second slide approximately a half slide thickness to provide a stop therefor.

The movement of the gripper 82, pusher lug 98 and stop shoes 60 in proper timed relation is accomplished by means of a control plate 110 (Fig. 3) mounted for reciprocal movement on the bottom 112 of channel 22 by virtue of pins 114 on plate 110 slidable along a slot 116 in a guide plate 118 secured to bottom 112 of channel 22 as best seen in Fig. 3. The control plate 110 has an abutment

120 at one end, and springs 122 are provided for urging arms 124 carried by gripper and pusher brackets 86, 99 respectively into engagement with abutment 120. The control plate 110 has transverse lugs 126 (Fig. 4) extending along each side 74, 84 of channel 22 for engaging lips 128 on stop plates 72 for reciprocally moving plates 72 against the bias of their springs upon movement of control plate 110. The control plate 110 has a depending, included lug 130 that is engageable by indexing pawl 20 on slide projector 14 when the slide projector is actuated to change slides. The indexing pawl 20 as it is moved angularly in a direction which would normally index a tray in a forward direction, engages inclined lug 130 and urges control plate 110 against the bias of springs 122 for operating the gripper 82, pusher lug 98 and stop shoes 60 in proper timed relation. To prevent plates 72 and stop shoes 60 from returning to their original positions too rapidly, thereby not allowing sufficient time for the released slide to be moved downwardly a sufficient distance to clear the returning stop shoes, a pivotal spring biased retard lever 136 is provided having an arm 138 adapted to drop behind indexing pawl 20 causing it to return more slowly to its original position.

In the operation of this invention, adapter 12 is initially mounted on a slide projector 14 as indicated heretofore with the slide openings in the housing and channel 22 in register with the slide gate 28. A stack of slides 16 to be projected is interposed between plate 48 and the stop shoes 60. The slide projector 14 is in its normal position with slide transport member 18 in its lowermost position for holding a slide 16, if any, in its projecting position as seen in Fig. 5. Upon operation of slide projector 14 through one cycle of operation as clearly explained in the aforementioned specifications, the slide transport member 18 moves to its uppermost position as seen in Fig. 7 to return a previously projected slide, and then is returned to its lowermost position for transporting a new slide to the projecting position. During such cycle of operation, when transport member 18 is in the uppermost position, the indexing mechanism is operated causing pawl 20 to actuate control plate 110, and following the operation of the indexing mechanism, transport member 18 is returned to its normal lowermost position. During the operation of slide projector 14, it is obvious that during the initial portion of the cycle of operation, a slide 16, if any, in the projecting position will be placed into a slide return position in channel 22 as seen in Figs. 7 and 8. At that point, the indexing mechanism is operated causing indexing pawl 20 to urge control plate 110 in its forward direction causing gripper 82 to engage one edge of the second slide and to urge its opposite edge into engagement with side 84 of channel 22, causing pusher lug 98

to engage one edge of the first or leading slide and free it from the second slide and provide a stop for the second slide, and causing stop shoes 60 to engage the returned slide and to urge it past the beveled edges of retainers 70 camming them out of the way of the slide (Figs. 9 and 10), the retainers 70 returning to their normal position for holding the slide in the take-up unit 46. Upon completion of this operation, the transport member 18 is returned to its lowermost position transporting the released first or leading slide into the projecting position. During this operation, a pressure plate 134, as described in the aforementioned specification No. 1,040,701 is moved to an open position for releasing the slide in the projecting position before transport member 18 begins its upward movement, and then is returned to its slide holding, pressure engaging position after the next slide 16 is moved into the projecting position.

WHAT WE CLAIM IS:—

1. A slide stack adapter for use with an optical slide projector of the kind defined, comprising a slide support member having a slide take-up unit, a slide supply unit for a stack of slides in side by side relation and having a spring for biasing the stack toward the slide take-up unit, the slide support member further defining a passage-way between the take-up and supply units, means on the slide support member for mounting the slide support member on the slide projector with the passageway in register with the gate, stop means for the stack of slides movable from a normal position across the passage-way into the slide take-up unit and back again, means for gripping a slide adjacent to the leading slide in the supply unit for holding the adjacent slide and remaining slides in the stack against the force exerted by the spring and means interrelating the stop means and gripping means for operation in timed relation, the interrelating means further being responsive to the operation of the indexing means for causing the gripping means to grip the adjacent slide as the transporting means returns any slide from the gate through the passage-way into the slide support member, and the stop means to be moved away from the leading slide so as to release said slide and to urge the returned slide into the take-up unit as the transporting means transports the released leading slide to the gate.

2. A slide stack adapter according to Claim 1, further including means operating in timed relation with the gripping means, stop means, and transporting means for engaging and pushing the leading slide to ensure its release from the second slide, and providing a stop for the adjacent slide.

3. A slide stack adapter according to claim 1 or 2, wherein the stop means comprises a reciprocally movable first plate having a first lug, the gripping means comprises a spring

120 at one end, and springs 122 are provided for urging arms 124 carried by gripper and pusher brackets 86, 99 respectively into engagement with abutment 120. The control plate 110 has transverse lugs 126 (Fig. 4) extending along each side 74, 84 of channel 22 for engaging lips 128 on stop plates 72 for reciprocally moving plates 72 against the bias of their springs upon movement of control plate 110. The control plate 110 has a depending, included lug 130 that is engageable by indexing pawl 20 on slide projector 14 when the slide projector is actuated to change slides. The indexing pawl 20 as it is moved angularly in a direction which would normally index a tray in a forward direction, engages inclined lug 130 and urges control plate 110 against the bias of springs 122 for operating the gripper 82, pusher lug 98 and stop shoes 60 in proper timed relation. To prevent plates 72 and stop shoes 60 from returning to their original positions too rapidly, thereby not allowing sufficient time for the released slide to be moved downwardly a sufficient distance to clear the returning stop shoes, a pivotal spring biased retard lever 136 is provided having an arm 138 adapted to drop behind indexing pawl 20 causing it to return more slowly to its original position.

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to engage one edge of the first or leading slide and free it from the second slide and provide a stop for the second slide, and causing stop shoes 60 to engage the returned slide and to urge it past the beveled edges of retainers 70 camming them out of the way of the slide (Figs. 9 and 10), the retainers 70 returning to their normal position for holding the slide in the take-up unit 46. Upon completion of this operation, the transport member 18 is returned to its lowermost position transporting the released first or leading slide into the projecting position. During this operation, a pressure plate 134, as described in the aforementioned specification No. 1,040,701 is moved to an open position for releasing the slide in the projecting position before transport member 18 begins its upward movement, and then is returned to its slide holding, pressure engaging position after the next slide 16 is moved into the projecting position.

WHAT WE CLAIM IS:—

1. A slide stack adapter for use with an optical slide projector of the kind defined, comprising a slide support member having a slide take-up unit, a slide supply unit for a stack of slides in side by side relation and having a spring for biasing the stack toward the slide take-up unit, the slide support member further defining a passage-way between the take-up and supply units, means on the slide support member for mounting the slide support member on the slide projector with the passageway in register with the gate, stop means for the stack of slides movable from a normal position across the passage-way into the slide take-up unit and back again, means for gripping a slide adjacent to the leading slide in the supply unit for holding the adjacent slide and remaining slides in the stack against the force exerted by the spring and means interrelating the stop means and gripping means for operation in timed relation, the interrelating means further being responsive to the operation of the indexing means for causing the gripping means to grip the adjacent slide as the transporting means returns any slide from the gate through the passage-way into the slide support member, and the stop means to be moved away from the leading slide so as to release said slide and to urge the returned slide into the take-up unit as the transporting means transports the released leading slide to the gate.

2. A slide stack adapter according to Claim 1, further including means operating in timed relation with the gripping means, stop means, and transporting means for engaging and pushing the leading slide to ensure its release from the second slide, and providing a stop for the adjacent slide.

3. A slide stack adapter according to claim 1 or 2, wherein the stop means comprises a reciprocally movable first plate having a first lug, the gripping means comprises a spring



5 biased pivotal bracket having a slide engaging lug and an arm, and the interrelating means comprises a reciprocally movable second plate against which the arm is biased, the second plate having a first lip for engaging the first lug, and a second depending lip engageable by the indexing means for reciprocally moving the second plate.

4. A slide stack adapter according to claim 1, constructed and adapted for use substantially as hereinbefore described with reference to, and as shown in, the accompanying drawings.

10

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