Jan. 28, 1969 R. A. HEISLER 3,423,863

SLIDE CHANGER AND SLIDE CARTON PASSABLE THERETHROUGH

Filed Dec. 8, 1966

Sheet 1 of 4

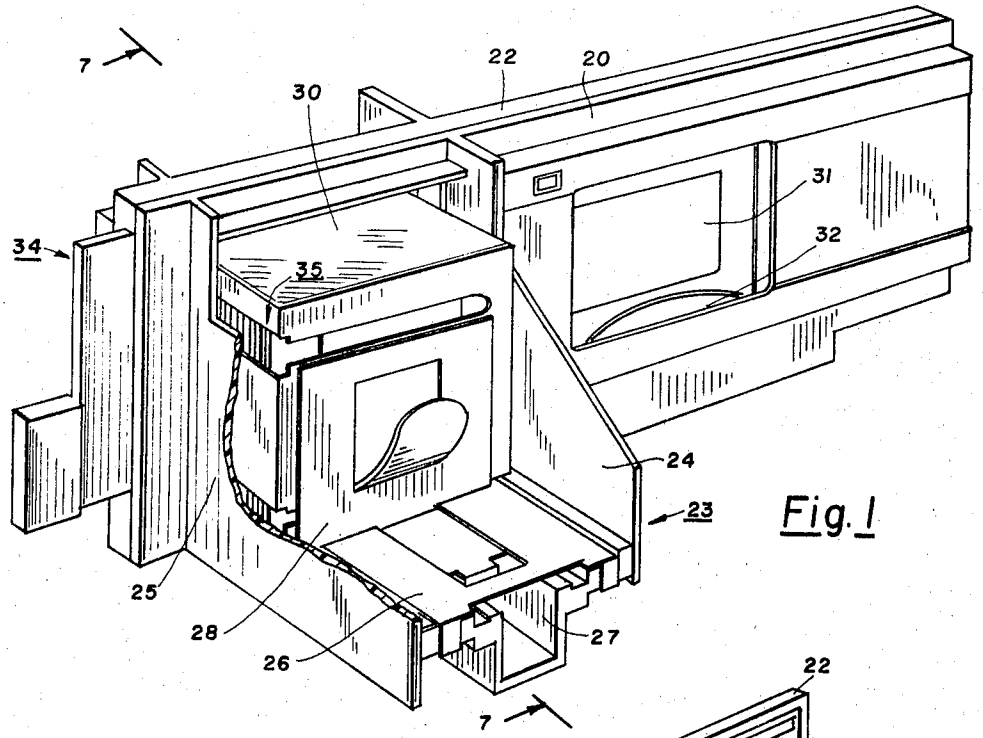


Fig. 1

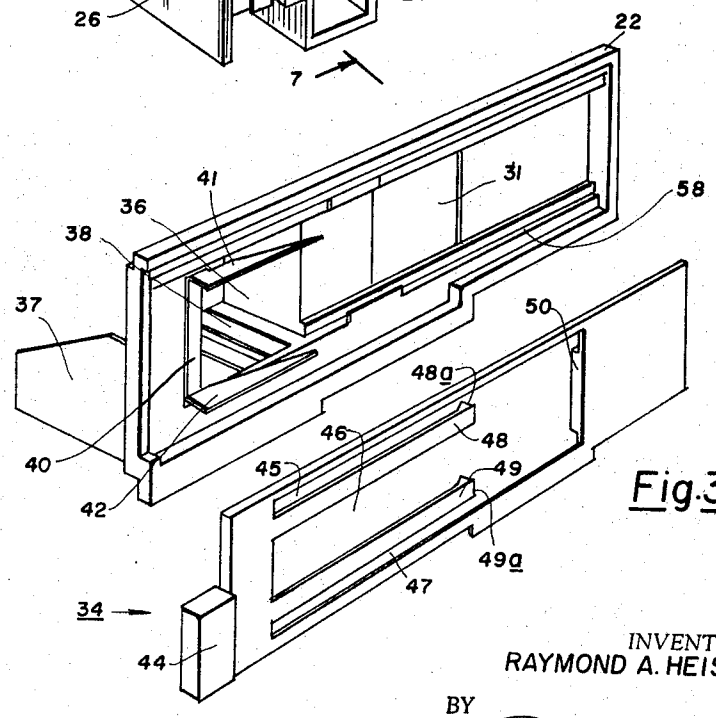


Fig. 2

Fig. 3

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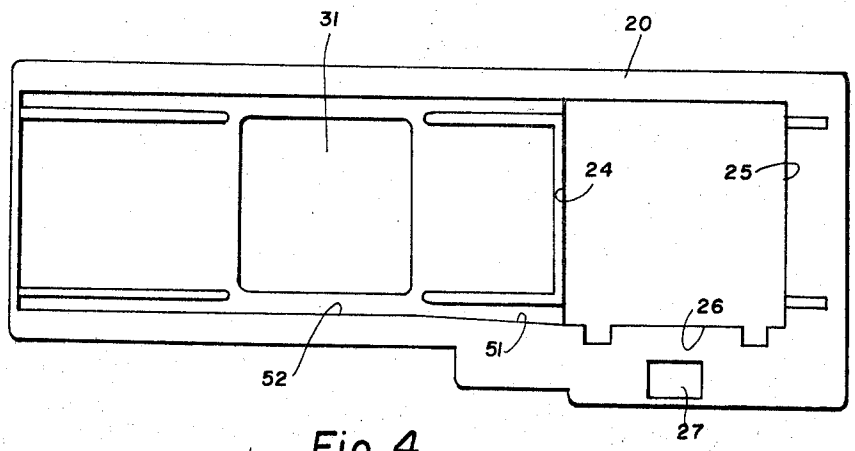


Fig. 4

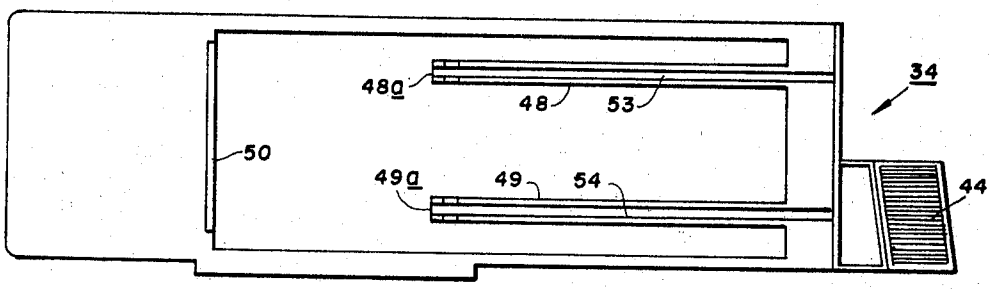


Fig.5

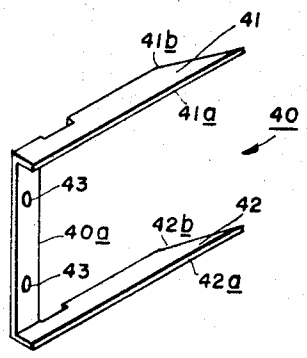


Fig.6

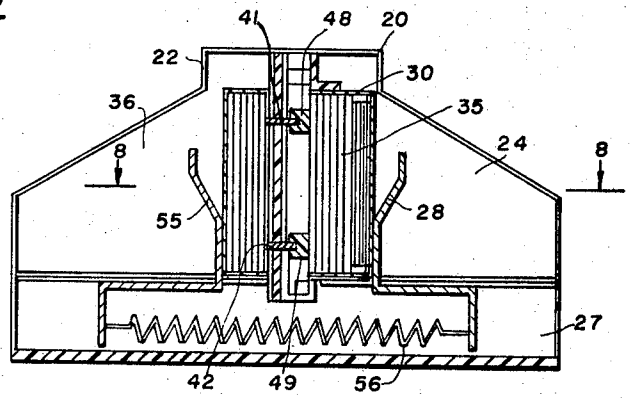


Fig.7

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SLIDE CHANGER AND SLIDE CARTON PASSABLE THERETHROUGH

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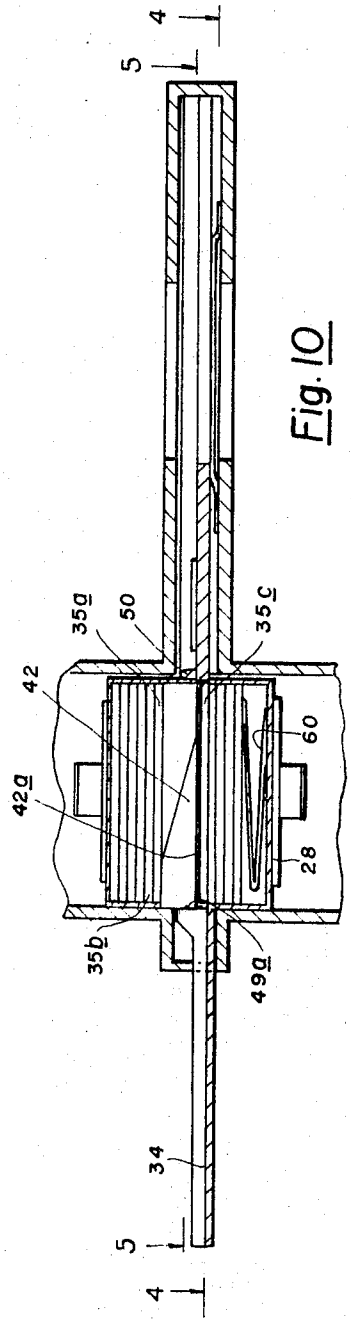


Fig. 10

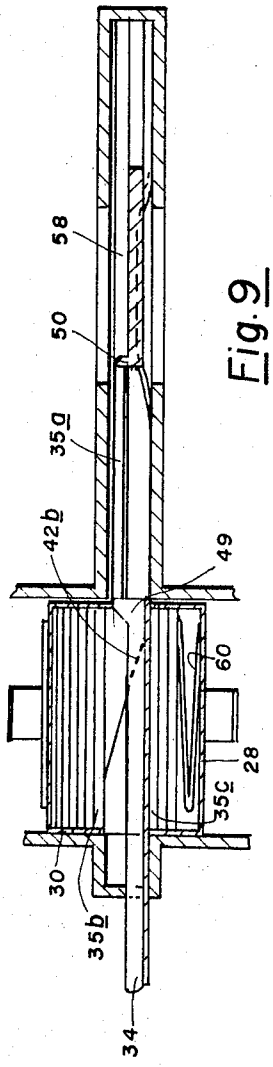


Fig. 9

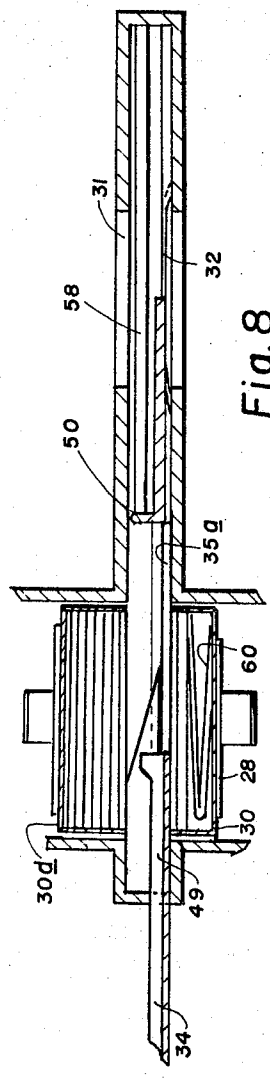


Fig. 8

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SLIDE CHANGER AND SLIDE CARTON PASSABLE THERETHROUGH

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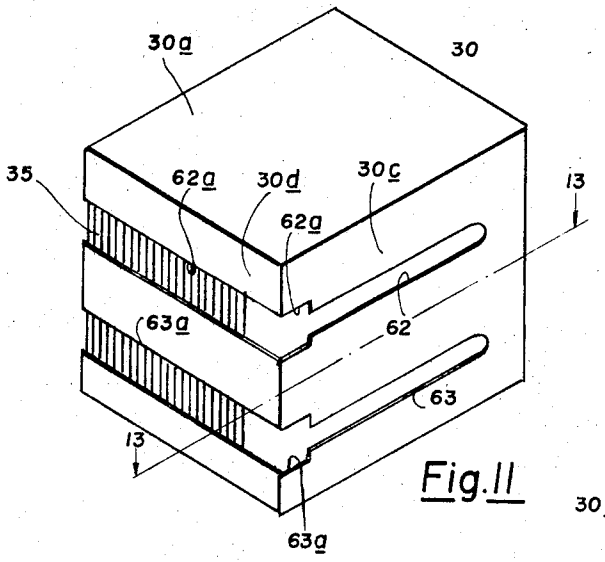


Fig. 11

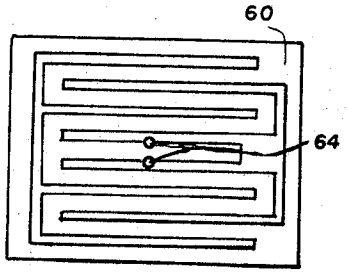


Fig. 14

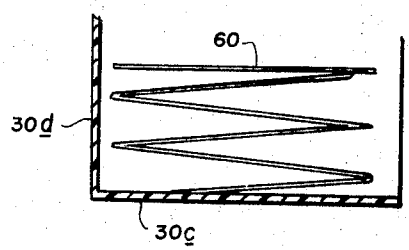


Fig. 13

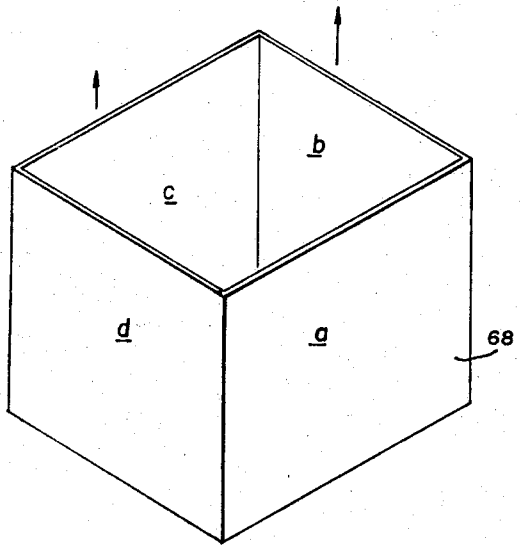


Fig. 12

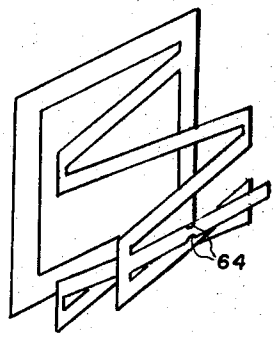


Fig. 15

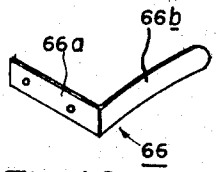


Fig. 16

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3,423,863

SLIDE CHANGER AND SLIDE CARTON PASSABLE THERETHROUGH

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Filed Dec. 8, 1966, Ser. No. 600,169
U.S. Cl. 40—79 18 Claims
Int. Cl. G09f 11/30

ABSTRACT OF THE DISCLOSURE

A slide changer and carton for use with a slide projector. The changer is provided with a pair of deflector fingers positioned to pass through aligned slots in three of five sides of one-half of a carton. The carton has an internal spring urging the slides to one side of the carton and to accommodate the pusher bar of the changer. The slides are packaged and stored in the carton and while stored in the inner one-half of the carton are movable through the changer where the slides, one at a time, are sequentially moved from the carton to a viewing position.

BACKGROUND OF THE INVENTION

Field of the invention

The slide changer of this invention falls within the general field of optics and in particular to projecting apparatus and more particularly to view changing devices.

The carton for retaining the transparencies, in addition to providing a storage means, is also movable through the slide changer with the slides stored therein. As a package the carton may be of folded paper as a box with dispensing and/or slide retaining means. As contemplated, the carton likely is an inexpensive plastic molding and the internal spring may be of metal or plastic.

As a combination the slide changer and carton acting as a tray for transparencies fall within the field of projection apparatus and to the particular classification of view changing devices.

Description of the prior art

Slide changers, particularly those that are of the type for manual operation, are well known. Recent view changing devices have provided means adapted to receive trays both longitudinal and rotary. These trays provide a fixed storage means for individual transparencies and both of these types of trays are bulky and expensive. Simplet slide changers adapted to receive a group of loose slides is exemplified by the U.S. Patent 3,077,817 to J. W. Ehemann, of Feb. 19, 1963. This and like type changers are adapted to receive a loose group of transparencies arranged in a desired array which are inserted into and removed from a retaining path in the changer.

Manual and other changers into which loose slides are grouped require a reassimilation of the slides after their passage through the projector. The original package in which the slides are shipped may of course be used as a storage means, however, the cardboard and/or molded plastic packages often require division of the slides into two packs. In packing for storage the sequence of the slides is often disturbed from the desired sequence which must then be checked before placement in the changer trough and regrouping after passing through the changer. Trays, passable through a changer or projector, although requiring four or five times the space and an additional expense in excess of the original shipping carton, are a convenience and hence are popular.

Many projectors are specifically arranged to provide trackways and tray engaging and advancing means such as racks and pinions. Each projector thus usually is

adapted to receive only a particular tray such as rotary or rectangular, hence confusion in the use of trays is often a problem. The storage of these trays, particularly rotary, is quite space consuming and the arrangement of the trays in the specific guideway of the projector is often a tricky or complicated procedure.

Summary of the invention

The great popularity of color transparencies called slides and projection apparatus for viewing these slides on screens such as three by four feet has often resulted in storage problems. Whether in color or black-and-white the low cost of the transparencies lends encouragement for their use as a retaining means of family scenes, trips and the like. Often the personal accumulations of slides run into several hundred transparencies. These transparencies are usually thirty-five millimeter film exposures retained in frames of paper, plastic or glass and having a generally two inch square outer size. The present frames conventionally vary in thickness from thirty-five to one hundred twenty-five thousandths of an inch in thickness.

This invention therefore relates to slide changers and particularly to manually operable slide changers used in projection apparatus of the type which is known as transparency projectors. More particularly this invention relates to slide changers of the type which are oftentimes removable from the projection apparatus itself although this is not a particular criteria of the invention to be hereinafter disclosed.

This invention even more particularly relates to a slide changer adapted to receive a carton of slides such as slides or transparencies of the two-by-two inch size. This carton not only acts as a tray for the slides as they are processed through the changer during the projection thereof but also to act as a storage carton for the slides during the time they are absent from the projector.

Still more particularly this invention relates to a slide changer which is usable in either an automatic, semi-automatic or manually operable in manner and in which slides are retained in a contiguous array in cartons. In one-half of the carton the slides are fed through the slide changer one at a time and in the same sequence are restored to the same carton half. Upon feeding all the slides through the changer and with the slides reinserted therein the carton half is removable from the changer whence the other outer-half of the carton may be applied as a dust cover. In this carton transparencies usually in groups of twenty or more are packaged, shipped and stored within the same carton. This carton and storage tray may be sized for all size and thicknesses of slides and as contemplated is substantially as inexpensive as the present shipping container.

The changer of this invention as well as accepting slides in the carton is also adapted to accept a loose array of slides in groups of one to fifty or more and of varying thickness and advance them sequentially into and through the projector.

In the preferred embodiment shown, a slide changer is adapted to reecive an array of slides stored in one-half of a storage carton and in the carton are dropped into a spring loaded advancing means in the changer and as the pusher is reciprocated said slides one at a time are brought in the way of the pusher and are moved into a viewing position in the projector and then are returned to their original array in the storage carton. It is contemplated that after being processed and mounted in the selected type of frames the slides are placed in an inner-half of a carton which is a five-sided container, rectangular in configuration, and having parallel slots arranged in three of its sides. A spring means is provided within the carton or container and is adapted to take up a determined amount of void necessary to allow the pusher to enter the interior of the carton and be retracted therefrom.

The changer itself is provided with narrow deflector fingers and has a pair of pusher extensions instead of a solid pusher bar. These extensions are sized so as to enter the slots in the rear of the slide carton and to engage a slide and push it from the box and into the changer. Means is provided on the pusher to engage the slide and return it to its sequence in the carton. The carton of this invention may be of cardboard, but preferably is molded of plastic. The inner carton has five sides with one open end. The outer sleeve or dust cover has a minimum of four sides but preferably has five sides sized to just slidably enclose the inner half. The carton size is determined by the size and quantity of slides to be shipped and stored therein.

It is therefore an object of this invention to provide a slide changer of simple construction which may be adapted for both manual and mechanical operation with the automatic or semi-automatic changer operated by conventional motive power. This slide changer is adapted to receive a contained stack of slides, the carton holding these slides being of determined construction and size and having laterally disposed passageways therethrough so that the carton or container is passable through the troughway of the slide changer. It is a further intent of this invention to provide a slide changer and film package container mutually arranged so that the container has a capacity of a pre-determined amount of slides of conventional size and construction. After the dust jacket outer-half of the carton is removed the inner-half slide carton is dropped in the way of a biasing transfer means in the slide projector and urged by said biasing means within the slide changer troughway this contained carton of slides is brought in the way of a pusher means of the slide changer. The manipulation of the pusher engages sequentially the slides in the carton which are advanced into the way of the light path of the projector in the usual manner.

It is a further object of this invention to provide a slide changer of simple construction and economical manufacture, the slide changer adapted to be used either as a manual changer or adapted for automatic or semi-automatic operation and in which the troughway of the slide changer itself is adapted to receive a packaged group of slides or a grouped, loose array of slides and by biasing means bring these slides in the way of a pusher mechanism in the slide changer. This pusher mechanism is arranged to eject one slide at a time from the pack or group and after viewing this slide to return the slide to the pack or group so that a subsequent or next slide may be brought in the way of the projection path in a manner above-described.

There has thus been outlined rather broadly the most important features of the present invention in order that a detailed description thereof that follows may be better understood and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereafter and which will form the subject of claims appended hereto. Those persons skilled in the art will appreciate that the conception on which the present disclosure is based may readily be utilized as the basis for designing other structures for carrying out the several purposes of this invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the concept and scope of this invention.

Brief description of the drawings

A preferred embodiment of this invention has been chosen for the purpose of illustration and description and is shown in accompanying drawings forming a part of the specification wherein:

FIG. 1 represents a perspective front view of the invention showing the slide changer and the one-half cartoned package of slides ready for insertion into a projecting apparatus and for the slides within the carton to be moved from the carton into the projection path;

FIG. 2 represents a perspective front view of the rear main member of the slide changer of this invention and showing the slide return deflecting means in particular;

FIG. 3 represents a perspective view of the slide pusher of the changer and showing in particular the pusher extensions spaced to engage and push the slide into the viewing path;

FIG. 4 represents a rear view of the front main member of the slide changer and looking in the direction of the arrows 4—4 of FIG. 8;

FIG. 5 represents a side view of the pusher of the slide changer as taken on the line 5—5 of FIG. 8 and showing in particular the backside of the pusher;

FIG. 6 represents an isometric view of the deflector member providing the camming and transferring means of the slide changer;

FIG. 7 represents a sectional view taken on the line 7—7 of FIG. 1 and looking in the direction of the arrows;

FIG. 8 represents a fragmentary, partly diagrammatic, sectional plan view of the slide changer taken substantially on the line 8—8 of FIG. 7 and showing the pusher as it engages the slide to push the slide part way from the carton and toward the projecting path;

FIG. 9 represents a sectional view as in FIG. 8 but with the pusher engaging the rightward edge of the slide to move the slide back to the container of slides after the projection of this particular slide;

FIG. 10 represents a sectional view as FIG. 8 but with the pusher completely retracted and in the outward or left position and adapted to engage a subsequent slide to push it rightwardly in the way of the viewing path;

FIG. 11 represents a somewhat diagrammatic isometric view of the inner one-half of the carton and its contained slides, the slides being shown in position within the carton, which half is ready to be dropped in the troughway of the changer;

FIG. 12 represents a dust cover or outer one-half of the carton adapted to a slide on the inner half of the carton of FIG. 11 and to retain the slides within the inner half to protect them from exposure to dust and the like;

FIG. 13 represents a somewhat diagrammatic and fragmentary sectional view on the line 13—13 of FIG. 11 and showing in particular a spring adapted to urge the slides to one side of the carton, the spring shown being of flat sheet metal and as viewed being in the unconfined state prior to loading the slides into the carton;

FIG. 14 represents a plan view of the forming of the spring of the carton of FIG. 13;

FIG. 15 represents an isometric view of the spring of FIG. 14 after bending to shape, and

FIG. 16 represents an isometric view of an alternate internal spring for the carton of FIG. 11.

Description of the preferred embodiment

Referring now in particular to the drawings in which like numbers refer to like members and in particular to FIG. 1 in which a slide changer is seen with the container of slides disposed in a slide-receiving troughway and with a spring urged pusher plate engaging the container to advance the carton and the slides therein in the way of a slide pusher to be hereinafter more fully described. The slide changer of this embodiment includes a front member **20** and a rear member **22**, said members being held in a contiguous face-to-face relationship and being substantially mirror images of each other with interior modifications adapted to provide a passageway for the slide and pusher to be moved therein. In this view it is to be noted that a troughway **23** is formed with sides **24** and **25** extending upwardly from a bottom support **26** having a groove **27** intermediate its sides. Carried in this groove is a spring to be hereinafter described and adapted to urge

a pusher plate 28 into engagement with an inner half carton and slide container generally indicated as 30.

To the right of troughway 23 and side 24 there is an aperture 31 formed in the assembled slide changer, this aperture is conventionally adapted for the passage therethrough of a light path emanating from a source of conventional design and not shown. Immediately below the aperture 31 is a spring 32 which is adapted to push the slide from an infeeding trackway to an outfeeding trackway in a manner to be hereinafter described. Front and rear member 20 and 22 are assembled as by rivets, by heat sealing, or the like, the manner of assembly being merely a matter of selection and having no part of this invention. Pusher 34 is adapted to engage and move slide 35, which slide 35 is one of several within the container 30.

Referring now in particular to FIG. 2 it is to be noted that member 22 in the manner of member 20 and troughway 23 has a similar troughway formed to extend rearwardly, this troughway has sides 36 and 37 which are spaced to correspond in alignment with sides 24 and 25 respectively so that when the members 20 and 22 are assembled there is provided a continuous transverse guideway of sides 24, 36 and 25, 37. Also to be noted in the rear member 22 is a bottom 38 of like size and configuration as to the bottom 26 shown in the front member 20. Attached to the inner wall of rear member 22 is a deflector member 40 having upper and lower deflector portions 41 and 42 acting in a dual purpose. These portions are formed and sized so that the front or facing edges as seen in FIG. 2 provide a stop plane against which the face of the slide 35 is brought prior to the advancement of the slide into the changer and into the viewing pathway through the aperture 31. The rightward end of the deflector portions 41 and 42 are tapered to provide substantially sharp forward ends extending at acute angles backwardly to the inner wall of the member 22. Each angled surface is adapted to engage the slide as it is moved leftwardly in the outfeeding pathway and to deflect this slide into a determined place in the carton or container 30. In the preferred embodiment, deflector member 40 is preferably stamped from a single piece of metal, bent into the desired shape and attached as by rivets and the like to the inner wall of the rear member 22.

Referring next to FIG. 6 it is to be noted that in the intermediate portion 40*a* of the member 40, holes 43 are provided for attaching by means of rivets, screws or the like to the wall of the rear member. The forward edges 41*a* and 42*a* of deflector portions 41 and 42 are preferably precisely formed and are parallel to each other to provide guide means for pusher portions of the pusher 34 to be hereinafter described. As seen, the angled or camming surfaces 41*b* and 42*b* are at exactly the same angle, however, this is not necessary as different angles are permissible as long as the amount of difference between the top and bottom angles do not stress and bend the slide as it is returned to the carton.

Referring next to FIG. 3 and pusher member 34 upon which there is formed a finger grasping portion 44 at the left end thereof and from this portion the full height and thickness of the pusher is formed and extends rightwardly a short distance, at which point there is formed cutouts or relief portions 45, 46 and 47 in between which are disposed pusher extensions 48 and 49. Each of these extensions is sized so that their forward ends 48*a* and 49*a* provide faces or engaging surfaces to engage the rear portion or left edge of slide 35. It is to be noted that the forward portions 48*a* and 49*a* are expanded slightly in width to provide for a satisfactory engagement of the slide whether it is thin as thirty-five thousandths of an inch in thickness or is thick as one-eighth of an inch. Further to the right and at a determined distance from the faces 48*a* and 49*a* there is a return face 50 formed in the pusher. This face is sized and spaced so as to engage the rightward or inner edge of the slide 35 as it is transferred into the way of the aperture 31 and the light path therethrough. The face 50 engages the slide as it is transferred from the infeeding to the outfeeding trackway of the changer and engages the rightward edge of the slide as it is returned into the carton or container 30.

Referring next to FIG. 4 it is to be noted that from bottom surface 26 the slide as it is moved toward the aperture 31 is raised slightly upwardly on the cam or sloped surface 51 and onto infeeding trackway 52, which as shown is parallel to but slightly above bottom surface 26. Trackway 52 is slightly above the outfeeding trackway in rear member 22 which outfeeding trackway is on a level above the bottom surface 38 and 26. This level is slightly above the inside of the carton 30. Molded ribs on each side of the aperture 31 are conventional means for sliding the slides thereon.

Referring next to FIG. 5 and the rear view of pusher 34 it is to be noted that inwardly or to the left of the grip end 44 the pusher extensions 48 and 49 are each formed with groove ways 53 and 54 respectively. These grooves are sized and spaced so as to precisely engage and slide on the edges 41*a* and 42*a* of deflection member 40 above-described. These edges provide precise tracks or guide means for the up and down retention of the pusher extensions 48 and 49. The cooperative relationship of groove and guide insures that the extensions are in the precise determined position as well as preventing undue deflection of the pushers. In this manner is provided not only a precise guide means but also a support preventing undue bending on these extensions and the breaking off or the displacing of them from the desired travel path into and out of the interior of the slide changer.

It is to be noted that between the facing surfaces of ends 48*a* and 49*a* and face 50 is a determined space substantially the same as the width of a slide and adapted to smoothly engage and retain a slide as it is pushed in the way of the facing edges 48*a*, 49*a* and 50 and to retain the slide therein until the slide is deflected from the outfeeding trackway by deflector 40 and into reposition in the container 30.

It is to be noted that the initial faces of sides 24 and 25 and bottom 26 as well as top of the member 20 define an opening or troughway through which the box or container retaining the slides therein are passed through with a small amount of clearance between carton and the defined opening.

Referring next to FIG. 7 it is to be noted that groove 27 extends through both the front and rear members 20 and 22 and within this groove 27 depending portions of front pusher plate 28 and a like rear pusher plate 55 are connected by a spring 56. Between pusher plate 28 and pusher plate 55 the container 30 and slides 35 therein are retained. Spring 56, of course, draws the two members 28 and 55 together and in this manner the container 35 is retained between the pushers. However, it is to be noted that in certain instances two springs may replace spring 56 with the inner ends of the replacement springs being retained at or approximately at the juncture of the two front and rear members 20 and 22.

Referring next to FIGS. 8, 9 and 10 there is shown the slide movement sequence. In FIG. 8 pusher extension 49 is in engagement with the near edge of a slide which in this particular case is identified as 35*a*. The slide has been moved from container 30 and with the forward edge of the slide adjacent face 50 is now being moved into the changer on the infeeding track until the slide is brought into the way of the aperture 31 in the usual manner. Spring 32 has been deflected and upon reaching the forward or rightward limit of its travel the slide is transferred into the rear of the changer and drops into a groove or outfeeding track 58. The face 50 is in engagement with slide 35*a* and as seen in FIG. 9 has started to return the slide to the container 30 and as this slide approaches the angled edge 42*b* (seen in dotted outline underneath pusher 49) this slide 35*a* is urged towards the already viewed group of slides indicated as 35*b*.

Referring next to FIG. 10 the slide **35***a* lies adjacent **35***b* both of them now having been viewed. The face **49***a* is now in the way of a new incoming slide **35***c* urged into position against deflectors **40** and **41** by an internal spring **60** and the external bias of pusher **28**. The slide **35***c* as it is brought against edge **42***a* and in the way of the end **49***a* is in position for the pusher **34** to advance the slide into the viewing portion of the changer.

Referring next to FIG. 11 it is to be noted that the container **30** is preferably molded of low cost plastic and in this way is quite inexpensive as well as being precisely shaped and sized. It is also to be noted that top **30***a* is solid as well as the bottom **30***b* (not shown) which is parallel to the top. Side **30***c* is formed with slots **62** and **63** therethrough which slots continue toward and to side **30***d* where the slots continue and are widened to widths **62***a* and **63***a*. The wider slots permit a positive passage of the container **30** through and in the way of the ends **48***a* and **49***a* of the pusher extensions when the operator forgets to pull the pusher all the way back to the transfer position of the slide **35**. These enlarged portions extend into wall **30***c* a short distance and are still designated **62***a* and **63***a*. In the wall opposite **30***c* and not seen, slots **62** and **63** are likewise formed with leftward ends **62***a* and **63***a* the slots in this wall being mirror images of the face **30***c*.

Opposite wall **30***d* there is no wall in the carton, this of course provides a passageway for the slides **35** to be inserted into the carton. It is to be noted that as pusher extensions **48** and **49** and the deflector portions **41** and **42** are also within the carton **30** as it is passed through the changer provision must be made for these parts within the width of the carton. An internal spring **60** as seen in FIGS. 13, 14 and 15 accommodates the various widths of the slides within the carton **30** as well as providing means for them to be packed without rattling. The spring **60** when urged toward the wall to which it is attached provides the space necessary in the container to accommodate the deflector portions **41** and **42** and the pusher extensions **48** and **49** when they are within the carton as it is passed through the slide changer.

The spring **60** as seen in FIGS. 13, 14 and 15 is preferably of sheet metal and is punched or stamped from a strip of metal in a die and in a subsequent operation the leg portions are bent so that the spring in a free state approaches the position of FIG. 13. The spring is mounted to the wall as by rivets, screws, clip or by heat welding to the plastic. Notches **64** are formed by round punches suggest one means for providing engaging and retaining shoulders for the attaching means. After attachment the spring **60** both in a free state and when moved to the wall **30***c* lies between the slots **62** and **63** to provide free passage for the deflector portions.

An alternate spring means is shown in FIG. 16 in which a leaf spring **66** in the general form of an L has the longer leg curved and angled inwardly. The shorter straight leg portion **66***a* is attached to the inner wall **30***d* with leg portion **66***b* spaced and adapted to lie against the inner wall **30***c* in its outer extreme of motion and by its bias is moved inwardly of the carton in a plane not in interference with the deflector portions and pusher extensions. Two springs **66** may be used to insure even thrust against the outer edges of the slides **35** in the carton. Whether the inner half of the carton has spring **60** or spring **66**, the spring means is disposed so that it engages only the outer film retaining frame which forms the outer portion of the slides **35**.

With the slides stacked within the inner-half carton **30** and with the spring **60** or alternate spring **66** urging the slides into a determined relationship to the opposite walls it is also desirable that said container **30** have an outer cover which also provides a secured dust-resisting wrap, such an outer cover **68** is shown in FIG. 12. This cover is preferably a five-sided member of inexpensive plastic and is molded and sized so as to slide over container **30** with end **30***a* providing the sixth side of the cover **68** or with the solid side opposite end **30***a* acting as the sixth cover side. The cover **68**, as seen, is moved upwardly in the direction of the arrows and is slid over the sides **30***c*, **30***d* and the side opposite **30***c* as well as the open end of the carton. If desired, the cover **68** may be brought down from the top counterflow to the arrows and with the bottom of carton **60** becoming the sixth side of the completed package. It is also to be noted that, if desired, the outer cover **68** may also be molded as a four-sided figure as seen with portions *a*, *b*, *c* and *d* encompassing side **30***c*, **30***d* and the two opposite sides and with the top side **30***a* and the opposite bottom side being exposed and providing the two other exposed sides of the finished carton.

Use and operation

The slide changer has been generally described above in connection with manual manipulation, however the pusher **34** may be arranged in many ways to be mechanically reciprocated in response to a signal. The essence of the invention is in the novel cooperation of pusher and inner-half carton.

With the carton providing an inexpensive shipping container, the inner-half **30** without removing the slides **35** is dropped into the troughway **23** and pusher **28** urges the carton and slides inwardly until the leftward slide engages surfaces **41***a* and **42***a* of the deflector **40**. Slots **62** and **63** permit the passage through the carton of these deflector portions. The pusher extension ends **48***a* and **49***a* readily enter the enlarged slots to engage and push the edge of the slide adjacent the edges **41***a* and **42***a* of the deflector member. The internal spring in the carton is urged wallwardly to accommodate the pusher as it enters the carton to push the slide from the carton into the changer. After moving into the outfeeding trackway the outwardly moving slide engages the deflector **40** and is moved to the backside of the deflector and into the carton inner-half.

It is to be noted that an alternate changer and carton performing substantially in the manner above-described may be made. In this alternate form there would be a single deflector, a single pusher extension and a single carton slot. Such an arrangement sacrifices much of the stability above-described in conjunction with the preferred embodiment, however it is possible to make and use. With the changer and carton sized for two inch by two inch slides, a deflector providing a stop adapted to engage about one-fourth of the slide frame would be made with about one-half inch of vertical width. The pusher extension would be slightly wider than the deflector, as for example three-quarters inch wide, and the single slot in the carton would be seven-eighths inch wide in the wall corresponding to wall **30***c*, while the remainder of the slot would be five-eighths inch wide. Springs would be mounted in the carton and on each side of the single slot.

The carton uniquely serves not only as a shipping container but as a storage container and a slide changer tray of small size and as a tray needs no toothed or similar means for spaced advancement. The advancement of the carton in the changer troughway is determined by the thickness of the slide frames in the carton.

The terms "up," "down," "in," "out," "left," "right" and similar terms are applicable to the changer and carton as described in conjunction with the accompanying drawings and such terms are merely for the purpose of description and does not necessarily apply to a position in which the changer and carton may be made or used.

Protection by Letters Patent of this invention in all its aspects as the same are set forth in the appended claims is sought to the broadest extent the prior art allows.

What is claimed is:

1. In a slide changer having a housing with a slide troughway therein the troughway adapted to receive a group of slides which when engaged by a biased pusher plate are urged through the troughway, and a pusher movable in the changer and disposed to move into and

through the troughway to engage a slide and move it into and through an infeeding pathway to a viewing aperture after which the slide is movable to and through an outfeeding pathway and back to the troughway, wherein the improvement comprises:

(a) a pair of deflector members each having a relative thinness and lying in a plane substantially parallel to the bottom of the troughway;

(b) a facing edge formed on each of the deflector members, the pair of edges forming a stop plane for the incoming slide, the stop plane lying substantially in the same plane as is traversed by the inner surface of the inward moving slide;

(c) a tapered cam surface formed on the exterior end of the deflector member which end is nearest the viewing aperture, the taper being formed on the side of the member opposite the facing edge with the taper expanding from the end and moving away from the facing edge, the taper disclosed to lie in the path of the outfeeding slide and move it from the path of the pusher and into the troughway;

(d) at least one pusher extension on the pusher adapted to engage the edge of the slide and move it from the troughway, the pusher extension being of a relatively narrow vertical extent and movable in substantially the same plane as one of the deflector members, the pusher extension being at least as long as the travel of the slide into the viewing aperture; and

(e) a bottom surface formed in the infeeding trackway, said bottom surface being sloped upwardly toward the aperture and the bottom surface of the outward feeding trackway is slightly below the opposite surface of the infeeding trackway at the point of transfer of the slide.

2. In a slide changer as in claim **1** in which there is a groove formed in the pusher extension, the groove sized and spaced so as to engage and slide on the deflector member.

3. In a slide changer as in claim **2** in which the discharge end of the bottom surface of the outfeeding trackway is a slightly determined distance above the bottom surface of the troughway.

4. In a slide changer as in claim **2** in which there are two pusher extensions the combined face extents of the extensions being less than half the length of an edge of a slide.

5. In a slide storage carton having inner and outer cooperatively mating halves, the inner one-half adapted to retain an array of slide transparencies in a contiguous relationship, the inner-half being a box-like structure having at least five side members and an open side, the top and bottom sides spaced so their inner surfaces slidably retain the slides by their edges and the open side providing means for inserting and withdrawing the slides from within the inner-half; the outer half of the carton sized and shaped to slidably engage the inner-half with one of the sides of the outer-half providing a dust cover and retainer for the open side of the inner-half; wherein the improvement comprises; at least one slot in each of three successive sides of the inner carton, said slot being substantially parallel to the top and bottom sides, the slot in the intermediate side extending the full width of the side and joining the slots in the adjacent sides so that the combined slot provides a channel-shaped void in the walls of the inner carton, a spring means sized and mounted within the inner carton so as to engage the frame of an outer slide and urge the array of slides against a wall adjacent the open side, the spring means further sized and spaced to lie within the carton and generally out of a plane defined by the slot.

6. In a slide storage carton as in claim **5** in which the inner one-half has two slots formed in each of three successive sides.

7. In a slide storing carton as in claim **5** in which the spring is a flat spring which when fully compressed lies generally in a plane substantially no thicker than the material from which the spring is formed.

8. In a slide storing carton as in claim **5** in which the spring means is at least one leaf spring in the form of an L with a first leg thereof attached to a wall member and a second leg is biased to move to and from an adjacent wall this second leg adapted to engage a portion of the frame of the outer slide of an array of slides.

9. In a slide storing carton as in claim **8** in which there are two L-shaped springs each disposed to engage one of two vertically opposite portions of the frame and on the same side of the slide.

10. In a slide storing carton as in claim **5** in which the slot in the intermediate side and for a continuing short distance into the slot portion of the adjoining sides is enlarged in width from the width of the remaining slots in the adjoining sides.

11. In a slide storing carton as in claim **6** in which the inner and outer-half are formed of cardboard and like sheet material which is cut and folded to final configuration.

12. In a slide storing carton as in claim **6** in which the inner and outer-halves are formed of molded plastic.

13. In combination, a slide changer for slide transparencies and the like and for a slide storage carton usable in part as a slide tray movable in a troughway in the housing of the changer, the troughway also adapted to receive loose slides in a side-by-side array, the changer having a pusher movable in the changer and disposed to move into and through an infeeding pathway to a viewing aperture and in which the slide is movable to and through an outfeeding pathway and back to the troughway; the storage carton having inner and outer cooperating halves, the inner one-half adapted to retain an array of slide transparencies in a contiguous relationship, the inner-half being a box-like structure having at least five side members and an open side, the top and bottom sides spaced so their inner surfaces freely, slidably retain the slides by their edges and with the open side providing means for inserting and withdrawing the slides from within the inner-half; the outer-half of the carton sized and shaped to slidably engage the inner-half with one of the sides of the outer-half providing a dust cover and retainer for the open side of the inner-half; wherein the improvement comprises:

(a) a deflector member mounted in the changer and lying in the slide troughway;

(b) a facing edge formed on the deflector member and forming a stop plane for the incoming slide, the stop plane lying substantially in the same plane traversed by the inner surface of the inward moving slide;

(c) a tapered cam surface formed on the exterior end of the deflector member which end is nearest the viewing aperture, said taper being formed on the side of the member opposite the facing edge with the taper expanding from the end and moving away from the facing edge, the taper disposed to lie in the path of the outfeeding slide and move it from the path of the pusher and into the troughway;

(d) at least one extension on the pusher adapted to engage the edge of the slide and move the slide from the troughway, the pusher extension being of a relatively narrow vertical extent;

(e) at least one slot formed in three successive sides of the inner carton and in the same plane, the slot disposed to lie in generally the same plane as the deflector member when the carton is placed in the troughway and so that as the inner carton is moved through the troughway and sized so that the deflector member will pass through the slot; and

(f) a slot width in the intermediate wall of the inner carton sufficient to not only accept and pass a deflector member but to also pass the end and extension portion of the pusher as it is moved from the

outside of the carton to and through the inside of the carton.

14. In a slide changer and slide storage carton as in claim 13 in which there is a groove formed in the pusher extension said groove sized and spaced so as to engage and slide on the deflector member as the pusher extension enters the troughway to engage the slide and push the slide into and through the infeeding pathway, the deflector member providing additional guiding support for the pusher as it is moved inwardly.

15. In a slide changer and slide storage carton as in claim 14 in which there are two deflectors of relative thinness each lying in a plane substantially parallel to the bottom of the troughway, and in which the deflectors are spaced so their facing edges form the stop plane, and in which there are two slots formed in the inner slide re. taining carton.

16. In a slide changer and slide storage carton as in claim 13 in which the discharge end of the bottom surface of the outfeeding trackway in the changer is above the bottom of the troughway an amount at least equal to the thickness of that portion of the carton side wall which is adjacent said discharge end.

17. In a slide changer and slide storage carton as in claim 15 in which the inner one-half of the carton has a spring means sized and mounted so as to engage the

frame of an outer slide and urge the array of slides against a wall adjacent the open side of the carton and with the spring means sized and spaced to lie within the carton and generally out of a plane defined by the slots.

18. In a slide changer and slide storage carton as in claim 17 in which each of the slots in the carton have the slot expansion portion in the intermediate side wall continued for a short distance into the slot portion of the adjoining sides, the expansion portion having a width sufficient to freely pass therethrough the pusher extension.

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