Oct. 14, 1969 G. J. ROBIN ET AL 3,472,138

PHOTOGRAPHIC APPARATUS

Filed June 12, 1967 5 Sheets-Sheet 1

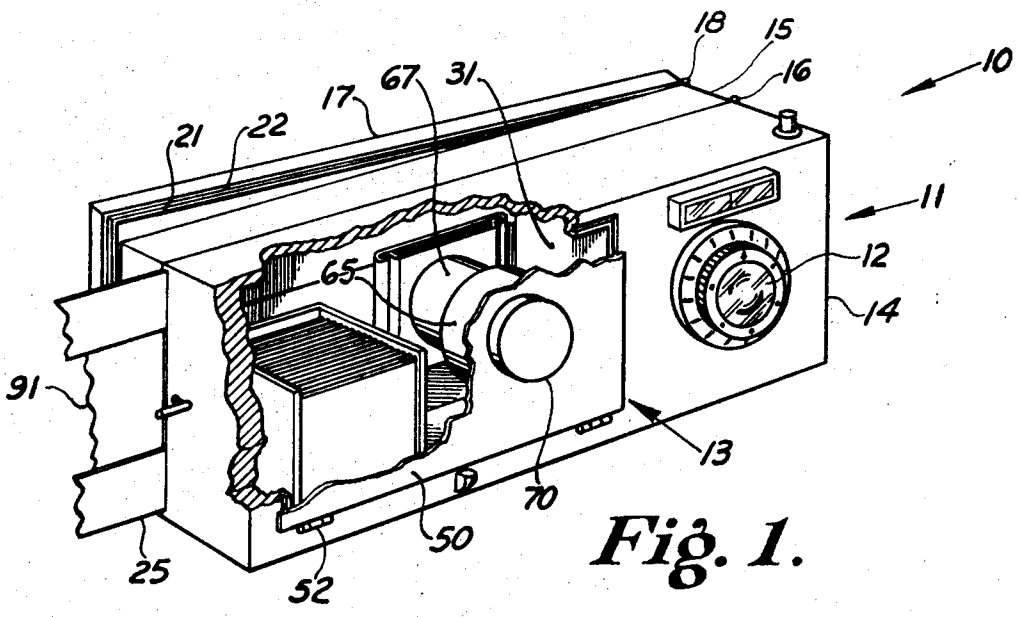


Fig. 1.

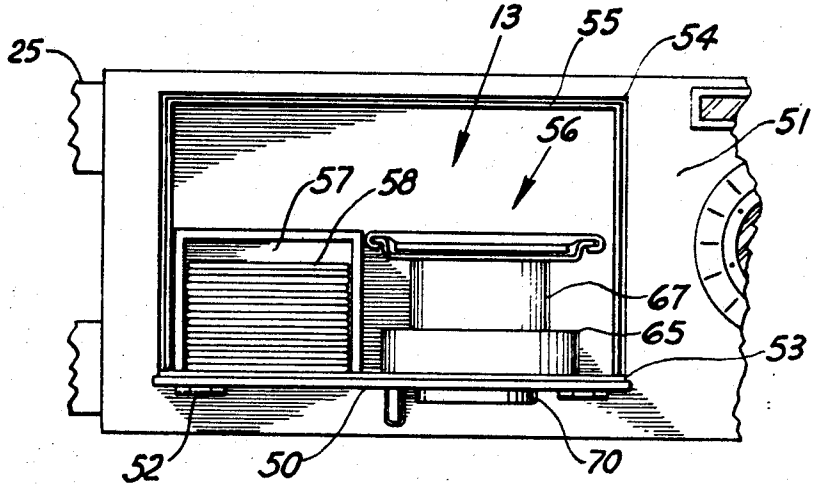


Fig. 2.

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PHOTOGRAPHIC APPARATUS

Filed June 12, 1967 5 Sheets-Sheet 2

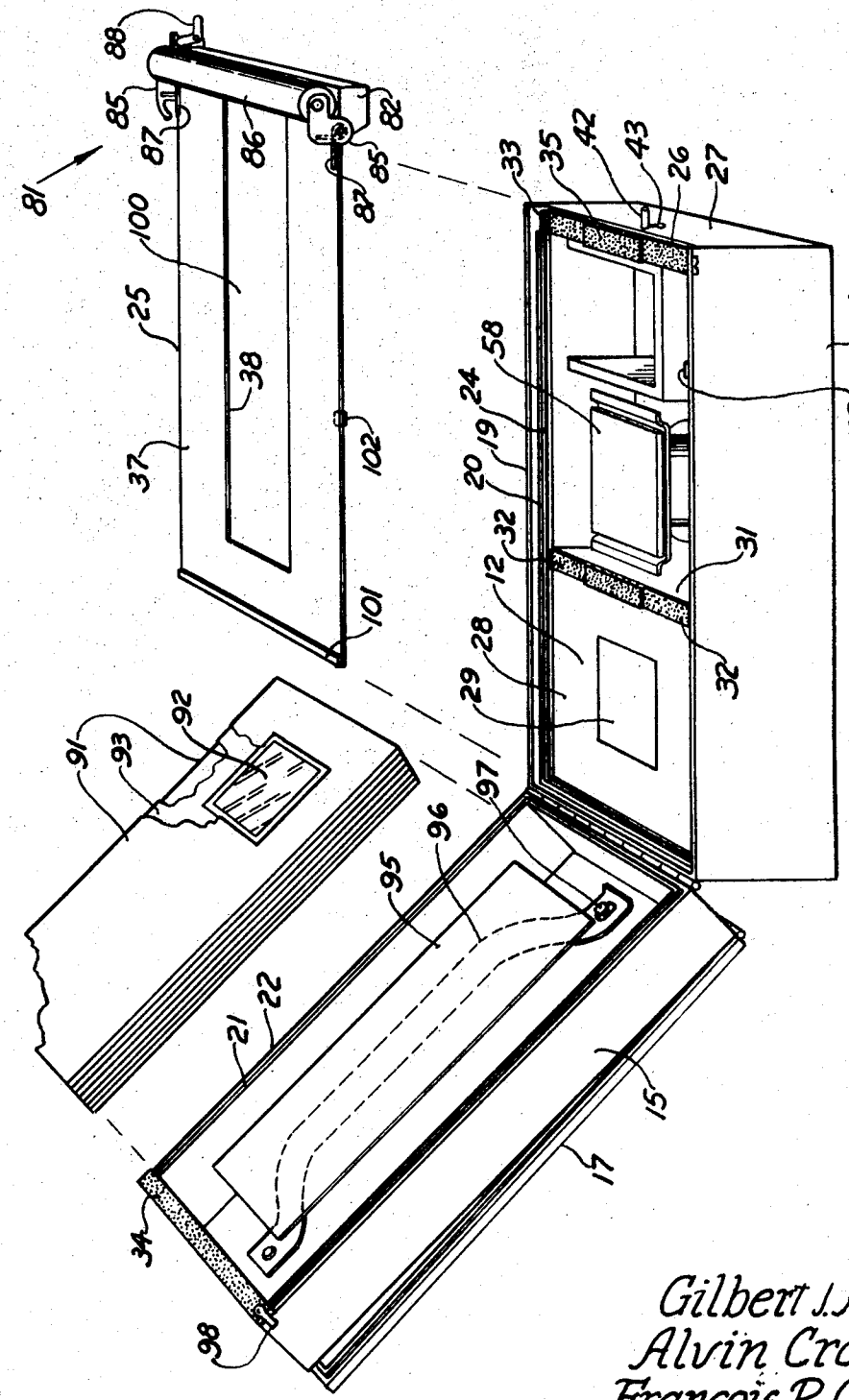


Fig. 3.

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PHOTOGRAPHIC APPARATUS

Filed June 12, 1967 5 Sheets-Sheet 3

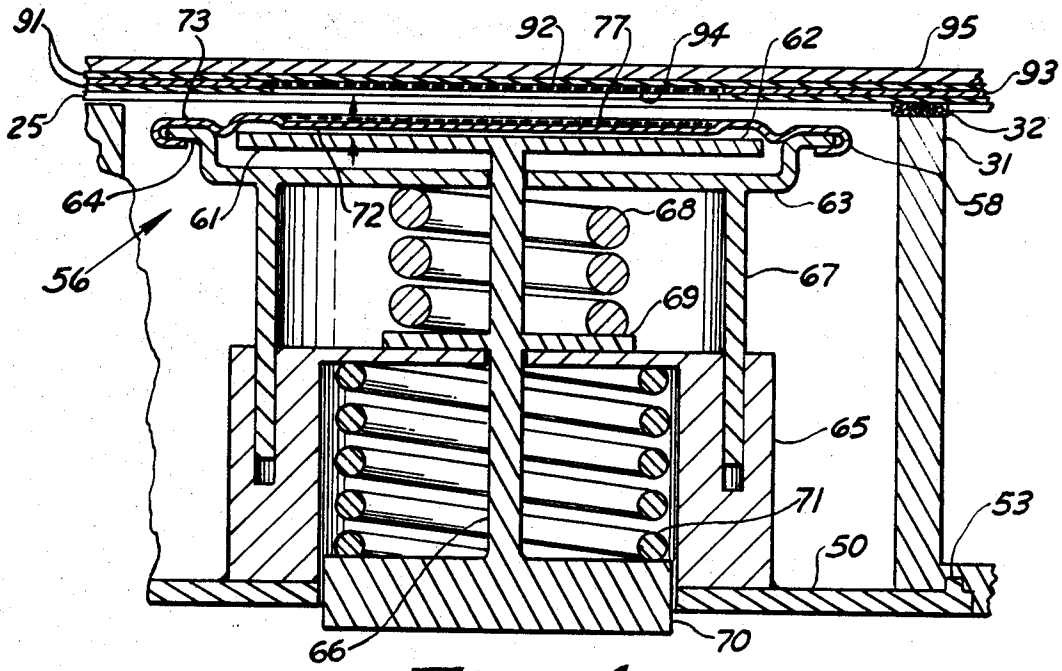


Fig. 4.

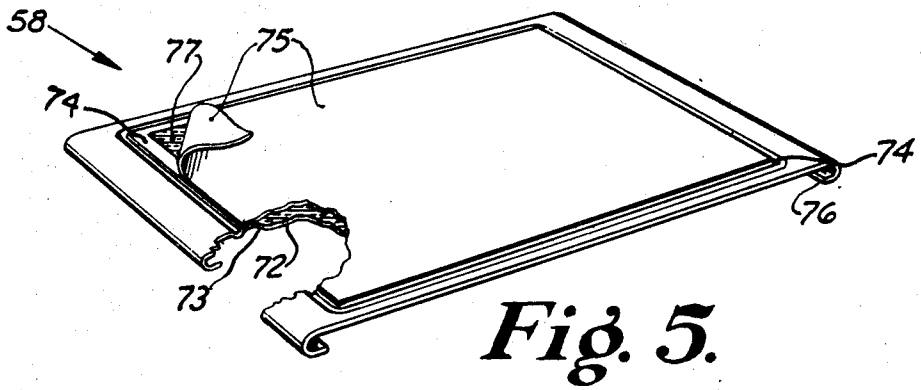


Fig. 5.

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PHOTOGRAPHIC APPARATUS

Filed June 12, 1967 5 Sheets-Sheet 4

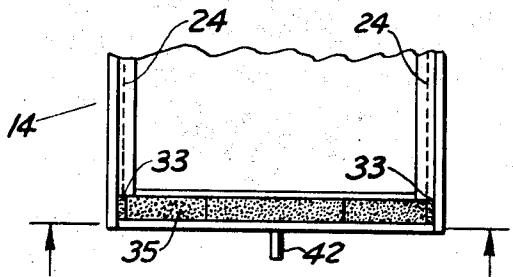


Fig. 6.

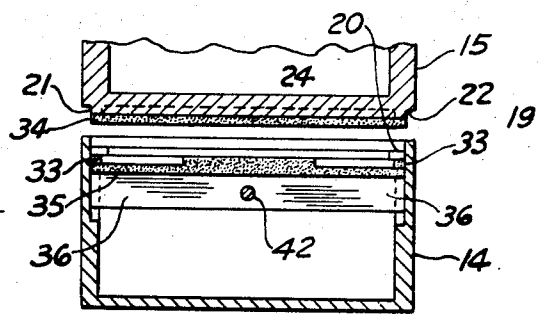


Fig. 7.

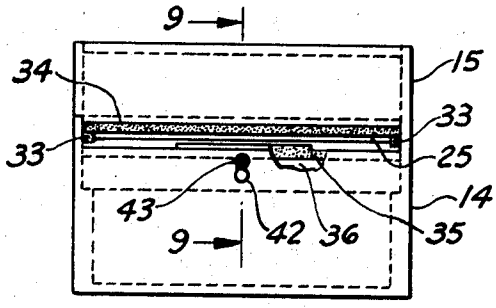


Fig. 8.

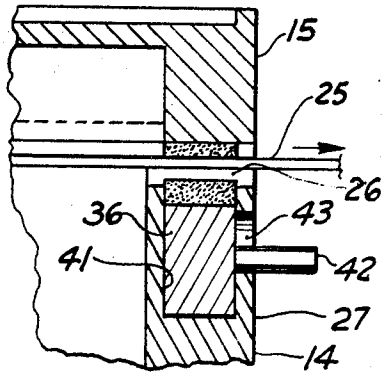


Fig. 9.

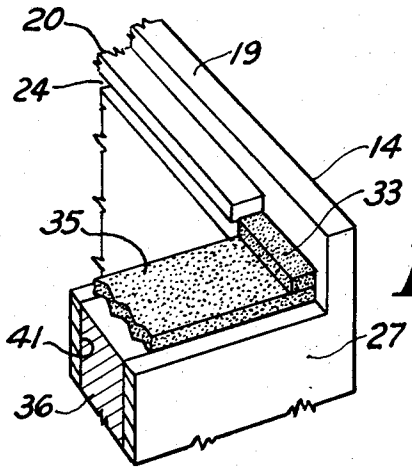


Fig. 10.

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Oct. 14, 1969 G. J. ROBIN ET AL 3,472,138

PHOTOGRAPHIC APPARATUS

Filed June 12, 1967 5 Sheets-Sheet 5

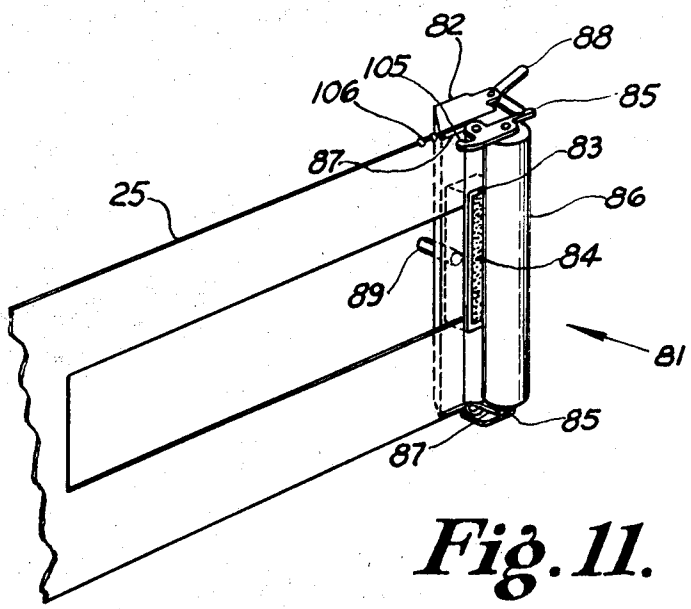


Fig. 11.

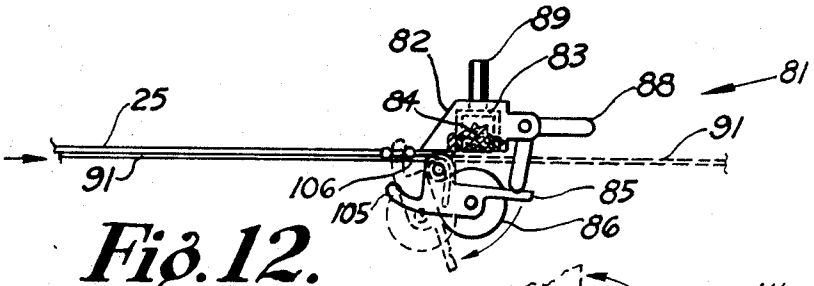


Fig. 12.

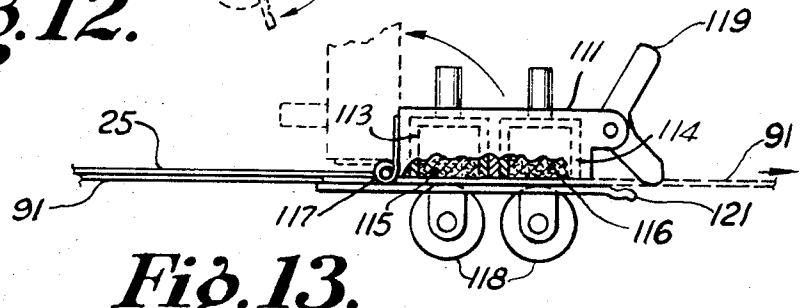


Fig. 13.

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United States Patent Office 3,472,138
Patented Oct. 14, 1969

3,472,138

PHOTOGRAPHIC APPARATUS

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Filed June 12, 1967, Ser. No. 645,384
Int. Cl. G03b 17/52
U.S. Cl. 95—13 34 Claims

ABSTRACT OF THE DISCLOSURE

A unitary photographic apparatus which can be loaded with a plurality of aperture card mounted microfilms and operated to expose and process the films without individual handling thereof. The loaded cards are sequentially conveyed within the apparatus from a fixed exposure position to a fixed processing position where a viscous processing reagent is applied to the film before removal of the card.

This invention relates generally to photographic apparatus and more particularly relates to a unitary photographic device especially suited for exposing and processing aperture card mounted microfilm.

The now well known microfilm aperture card is a data processing card having an aperture in which a frame of microfilm is mounted. Typically, the mounted microfilm contains a graphic image of a previously photographed visual presentation and the card contains a key for locating the recorded information by, for example, electronic data processing computers. The ability of microfilm aperture cards to both handle total graphic information and to be quantitatively indexed has resulted in extremely efficient and extensive information management systems.

However, despite the many desirable features exhibited by aperture card systems, they have not come into extensive use because of other disadvantageous characteristics. Primary drawbacks have been the great complexity and relatively high cost of the presently available aperture card processing systems. These factors have limited the practical utility of the microfilm aperture card to extremely high volume information management systems. The same factors have limited the system principally to applications wherein the material being photographed can be brought directly to the aperture card camera and processing equipment. This latter requirement negates the potential usefulness of aperture cards for those applications wherein one desires a photographic record of a visual presentation which as a practical matter, cannot be moved to a remote location and also desires to know immediately that a suitable photographic image of the presentation has been obtained. Such applications are multitude and include, for example, those instances in which one desires a photographic record of industrial equipment, prototype devices, blackboard presentations, etc.

A solution of the above problems is provided by the photographic processing apparatus described in U.S. application Ser. No. 613,603 of Alvin Cronig and Francois R. Gruber filed Feb. 2, 1967 and assigned to applicants' assignee. That application describes a portable photographic unit especially adapted to process individual film frames mounted in aperture cards. The processor unit includes a demountable film retaining magazine suitable for use with a complementary camera unit during exposure of the microfilm. Although the equipment described solves many of the above noted problems and greatly enlarges the application potential of microfilm aperture cards, it does exhibit certain disadvantages. For

example, because of the multiple independent units involved, the system inherently involves a relatively large number of operating steps for complete handling of the microfilm between exposure and processing. Also, the necessity of individually handling each aperture card during each step of the complete operation somewhat limits the flexibility of the system.

The object of this invention, therefore, is to provide a compact, unitary photographic device which can be sequentially used for both exposing and processing aperture card mounted microfilm.

Another object of this invention is to provide a photographic device of the above type which, after a single loading, is capable of sequentially producing a plurality of graphic image retaining aperture cards.

One feature of this invention is the provision of a portable photographic device adapted to receive aperture card mounted microfilm and including a light-tight housing which encloses both a camera mechanism and a viscous processing reagent applicator. After exposure of the microfilm in a fixed exposure position within the housing a conveyor mechanism moves the aperture card mounted microfilm to a fixed processing position where the applicator presses a layer of viscous processing reagent against the microfilm before its removal from the housing. With this device, one can produce rapidly on aperture card mounted microfilm a fully processed graphic image of a visual presentation situated in practically any location.

Another feature of this invention is the provision of a photographic device of the above featured types wherein the light-tight housing defines a film well adapted to contain a plurality of microfilm retaining aperture cards and including a film supply mechanism which automatically positions a new microfilm in the exposure position after removal of a previously exposed and processed aperture card. This device eliminates the requirement for a separate film loading step before each exposure operation.

Another feature of the invention is the provision of a photographic device of the above featured types wherein the applicator applies processing viscous contained in individual, disposable pods and the device includes a supply well adapted to stow a plurality of the pods. This feature helps insure for a user the availability of a supply of processing pods to accommodate the plurality of aperture cards retained within the housing.

Another feature of the invention is the provision of a photographic device of the above featured types wherein the applicator mechanism includes a support member adapted to support a flanged portion of the viscous containing pod and a flat applicator surface adapted to force a flexible bottom wall of the pod against the microfilm being processed. The support member and applicator surface are operated by an actuating assembly which initially produces simultaneous movement of both support member and applicator surface in a direction toward the retained microfilm and after detention of the pod's flanged portion produces further movement only of the applicator surface so as to forcibly flex the pod's bottom wall against the microfilm.

Another feature of the invention is the provision of the photographic device of the above featured types wherein the aperture card mounted film frames are conveyed from the exposure position to the processing position by a slide plate which extends through an exit slit in the light-tight housing. The slidable plate provides an extremely simple and effective transport mechanism for the retained aperture cards.

Another feature of the invention is the provision of a photographic device of the above featured types wherein the light seal surrounding the slide plate exit slit includes

a seal portion movable between a closed position in contact with the slide plate and an open position spaced therefrom. The movable seal portion eliminates possible soiling of the seal by processing reagent during removal of processed aperture cards from the light-tight housing.

Another feature of the invention is the provision of a photographic device of the above featured types including a neutralizer unit attached to that portion of the slide plate which extends outside the light-tight housing. The neutralizer unit is adapted to apply a neutralizing reagent to the mounted microfilm as the aperture card is withdrawn from the light-tight housing thereby eliminating the requirement for an additional step after removal of the card.

Another feature of the invention is the provision of a photographic device of the above featured type wherein the neutralizing unit is adapted also to apply an ultraviolet light filter coating to the fully processed and neutralized microfilm thereby rendering the resultant aperture cards useful in permanent information storage systems.

Another feature of the invention is the provision of a photographic device of the above featured types wherein the individual aperture cards are enclosed in opaque envelopes having apertures which coincide with the microfilm frames. The envelopes prevent simultaneous exposure of several film frames.

These and other features and objects of the present invention will become more apparent upon a perusal of the following specification taken in conjunction with the accompanying drawings wherein;

FIG. 1 is a partially cut away, front perspective view of the invention;

FIG. 2 is a partial front view of the invention showing the processor unit in an open position;

FIG. 3 is a rear perspective view of the invention showing the housing open and the aperture cards and slide plate mechanism removed;

FIG. 4 is an enlarged cross sectional view of the processing reagent applicator unit shown in FIGS. 1–3;

FIG. 5 is an enlarged perspective view of a processing reagent filled pod suitable for use with an applicator of FIG. 4;

FIG. 6 is a partial rear view of the housing base showing the exit slit and movable seal portion;

FIG. 7 is a cross sectional view of the housing base and intermediate sections taken along lines 7—7 of FIG. 6;

FIG. 8 is an end view of the housing base and intermediate sections illustrating the exit slit and surrounding light seals;

FIG. 9 is a partial cross-sectional view of the exit slit taken along lines 9—9 of FIG. 8;

FIG. 10 is a partial perspective view of the portion of the seal surrounding the exit slit;

FIG. 11 is a perspective view of the slide plate shown in FIG. 3 and clearly illustrating the attached neutralizer unit;

FIG. 12 is a top view of the slide and neutralizer unit shown in FIG. 11; and

FIG. 13 is a top view of another slide plate embodiment of the invention.

Referring now to FIGS. 1–3, there is shown the photographic device **10** including the conventional camera unit **11** and the viscous processor unit **13**. Enclosing both the camera **12** and processor **13** is a light-tight housing formed by the base enclosure **14**, the open ended intermediate housing section **15** attached by the hinge **16** and back cover **17** attached by the hinge **18**.

The walls of the base enclosure **14** possess edges **19** and interior shoulder portions **20** which engage the accommodating ridges **21** and outer shoulders **22** so as to form light-tight seals upon closure of the intermediate section **15**. Similar light-tight seals are formed between the surface of the intermediate section **15** and the cover **17**. Below the shoulders **20** in the inner surface of the base enclosure **14** are the slots **24** which slidably receive the slide plate **25** via the recess opening **26** in the base end wall **27**. The camera back plate **28** with the exposure aperture **29** is flush with the lower edge of the slot **24**. Separating the camera unit **12** and processor **13** is the divider wall **31** having on its rear edge the black felt strip **32** which engages the front surface of the slide plate **25** so as to form a light-tight seal therewith.

Mounted on the inner side wall surfaces of the base enclosure **14** adjacent the terminations of the slots **24** are the felt pieces **33** (FIGS. 6–10) which contact the edges of the slide plate **25**. Similar felt strips **34** and **35** attached to the intermediate section **15** and the seal actuator **36** and contact, respectively, the back **37** and front **38** surfaces of slide plate **25** in addition to the felt pieces **33**. Thus, upon closure of the intermediate section **15**, the felt strips **33**, **34** and **35** form a light sealed passage for the slide plate **25**.

As shown in FIGS. 9 and 10, the seal actuator **36** is movably mounted in the cavity **41** and has the actuating lever **42** which extends through the elongated aperture **43** in the base end wall **27**. The aperture is adapted to retain the seal actuator **36** in positions wherein the felt strip **35** is either in or out of contact with the slide plate **25**.

The processor unit **13** is supported by the plate **50** which is attached to the front face **51** of the base enclosure **14** by the hinges **52** allowing the entire unit to be swung into the readily accessible position shown in FIG. 2. Projecting from the inner margin of the plate **50** is the tongue **53** which upon closing of the hinged plate **50** fits into a groove **54** located in the recessed frame **55** formed in the front face **51** thereby providing a light seal therewith. Included in the processor assembly **13** is the applicator **56** and the supply well **57** shown loaded with the viscous filled vessel pods **58**.

As shown in greater detail by FIG. 4, the applicator **56** comprises the applicator plate **61** with a flat top surface **62** and the vessel support **63** with the outwardly extending flanged portions **64**. The inverted cup-shaped applicator base **65** has an open end mounted on the inner surface of the plate **50** and a closed end apertured to slidably receive the actuating post **66**. Projecting through an opening in the plate **50** is the button **70** attached for movement with the applicator plate **61** by the post **66**. The hollow cylinder **67** is attached for movement with the support **63** and is adapted for axial movement in an annular channel in the base **65**. Biasing of the various components is provided by the cylindrical spring **68** attached between the support **63** and the disc **69** and cylindrical spring **71** positioned between the base **65** and the button **70**.

FIG. 5 shows a preferred film processing reagent container pod **58** for use with the applicator **56** of FIG. 4. The shallow container vessel **58** is formed of a suitable flexible material which permits relative movement between vessel's bottom wall **72** and side walls **73**. Extending outwardly from the side walls **73** are the flanged portions **74** to which are removably sealed the top wall **75**. Two opposite flanged portions **74** include reentrant fastener edges **76** adapted to engage the underside of the vessel support flanges **64**. The viscous processing reagent **77** contained by the vessel pod **58** can comprise any conventional monobath processing solution to which has been added a compatible thickening substance. Suitable thickeners include, for example, natural and synthetic polysaccharides, enzymes, starches, thermoplastic and thermosetting resins, etc.

As shown in FIGS. 11 and 12, the neutralizer unit **81** is attached to one end of the slide plate **25**. The neutralizer unit **81** includes the elongated receptacle **82** adapted to receive the removable retainer **83** which supports an absorbent pad **84** permeated with a suitable film neutralizer reagent. Pivotally attached to the ends of the receptacle **82** by brackets **85** is the cylindrical roller **86**

which lies parallel to the elongated pad **84**. Spring members **87** attached at the pivotal connections of the brackets **85** urge the roller **86** in a direction tending to produce contact with the elongated pad **84**. Such contact can be prevented by moving the cam lever **88** into an open position wherein a given spacing is maintained between the roller **86** and the pad **84**. The pad retainer **83** is held in the receptacle **82** by the pin **89** which forcibly engages a fitted opening in the rear surface of the receptacle **82**. Removal of the retainer **83** is produced by pressing on that portion of the pin **89** which projects through the receptile **82**.

Prior to utilization, the device **10** is loaded, preferably in a dark room, with a plurality of light-impervious envelopes **91** made, for example, of black paper and containing the microfilm frames **92** mounted in aperture cards **93**. The generally well known aperture cards are conventional and of the type, for example, described in U.S. Patents Nos. 2,512,106 and 2,587,022. Apertures **94** through one thickness of the envelopes **91** coincide with the microfilm frames **92**. The envelopes **91** are inserted into the film well formed by the intermediate section **15** after opening of the cover **17**. After loading, all of the film frames **92** face and are retained in alignment with the exposure opening **29** in the camera wall **28** and with the inner portion of the elongated aperture **100** in the inserted slide plate **25**. The innermost envelope **91** is urged against the rear surface **37** of the slide plate **25** by the pressure plate **95** attached to the inner surface of the cover **17** by the resilient spring member **96**. One end of the spring member **96** is fixed to the back cover **17** while the other end is retained by a rivet **97** passing through an elongated slot which allows relative movement between the spring and the back cover. After closing and securing the cover **17** with the latch mechanism **98** the device **10** is ready for utilization.

The camera unit **11** is operated conventionally to expose through the opening **29** the directly adjacent microfilm frame **92** so as to produce thereon a desired image. Subsequently, the processor unit **13** is opened by pivoting the support plate **50** outward and a processing pod **58** is withdrawn from the supply well **57**. After removal of the cover sheet **75** the pod's reentrant portions **76** are placed over the support flanges **64** and the processor unit **13** is pivoted into the closed position shown in FIGS. 1 and 3. The user then begins withdrawing the slide plate **25** from the base **14** through the light sealed opening provided by the felt strips **33**, **34** and **35**. During this movement the transverse ridge **101** on the slide plate **25** engages the edge of the innermost envelope **91** and effects simultaneous movement thereof. Slide movement continues until the stop **102** engages the abutment **103** on the base enclosure **14**. In this position the previously exposed microfilm **92** is aligned with the opened pod **58** and the applicator plate **61**.

The user then pushes the button **70** causing inward movement of the post **66** and compression of the spring member **71**. During initial movement of post **66**, the disc **69** produces unitary motion of the entire applicator assembly including the spring member **68**, the pod support **63** and the pod **58**. However, after the pod surfaces **73** contact the slide **25** preventing further motion of the support **63**, additional inward movement of the button **70** and attached post **66** compresses the spring member **68** and urges the applicator plate **62** into forcible contact with the bottom surface **72** of the pod **58**. This causes a flexing movement of the pod bottom **72** through the slide aperture **100** and forces the contained processing reagent **77** against the surface of the previously exposed microfilm frame **92**. The applicator is maintained in this position for a period of, for example, ten seconds sufficient to thoroughly develop the image on the microfilm. Upon release of the button **70**, the spring members **68** and **71** return the various components to their original positions.

Before removal of the processed microfilm **92** and enclosing envelope **91** from the photographic device **10**, the neutralizer unit **81** is prepared by inserting a neutralizer pad **84** into the housing **82**. This is accomplished by pivoting the brackets **85** and roller **86** into an open position maintained by a gripping engagement between the pin **105** and the catch **106**. After insertion of a pad **84**, the pin **105** is manually disengaged from the catch **106** permitting the roller **86** to pivot into a closed position under the influence of the spring members **87**. However, a slight spacing is maintained between the roller **86** and pad **84** by the lever arm **88** which contacts one of the brackets **85**. A single pad **84** can be utilized to neutralize several processed film frames and need be replaced only after a plurality of neutralizing operations or when a substantial time period elapses between successive neutralizing operations. With the neutralizer unit **81** prepared, the user manipulates the pin **42** moving the seal actuator **36** forward and eliminating contact between the felt strip **35** and the surfaces of the slide plate **25** and adjacent envelope **91**. In this way, the felt strip **35** is not smeared, during withdrawal of the envelope **91**, with processing reagent remaining on the film frame **92**. The user then grasps that portion of the envelope **91** made accessible by the previous withdrawal movement of the slide plate **25** and passes it through the space existing between the roller **86** and the neutralizer pad **84**. However, before completely removing the envelope **91**, the lever arm **88** is released permitting the roller **86** to exert pressure upon the envelope **91**. Thus, as the envelope is pulled through the neutralizing unit **91**, the film frame **92** contacts the pad **84** and is completely neutralized by its neutralizer reagent content. After movement of the film frame **92** by the pad **84** but before complete withdrawal of the envelope **91**, the lever arm **88** is again operated to produce a clearance between the roller **86** and the pad **84**. This action prevents smearing of the roller **86** with neutralizing reagent after complete withdrawal of the envelope **91**.

Upon completion of the neutralizing operation, the slide plate **25** is reinserted and the ridge **101** engages the edge of the next envelope **91** which is pressed against the slide by the pressure plate **95**. Prior to slide plate insertion, however, the seal actuator **36** is forced into its rearward position causing the felt strip **35** to complete the light-tight seal around the slide plate **25**. The above described exposure, processing and neutralizing actions then can be repeated on the next microfilm **92** and envelope **91** and thereafter on each successive aperture card **93** until the entire supply within the intermediate section **15** has been exhausted.

Thus, the present invention provides an extremely compact combination photographic device which can be used in any desired location and under a wide variety of environmental conditions to both expose and process photographic film with a minimum number of required operating steps. As described, the invention is particularly useful in conjunction with information management systems because of its particular suitability for use with microfilm aperture cards. In this regard, it will be noted that the unique incorporation of a viscous processor unit adds substantially to the flexibility and simplicity of the overall device.

FIG. 13 shows another plate embodiment in which the receptacle **111** possesses two cavities which receive retainers **113** and **114** similar to the retainer **83** shown in FIGS. 11 and 12. Supported within the retainers **113** and **114** are the pad **115** saturated with a neutralizing reagent and the pad **116** saturated with a liquid suitable for forming an ultraviolet light filter coating on processed film. The receptacle **111** is pivotally attached to the slide **25** and is biased by the spring member **117** into engagement with the rollers **118** rigidly connected to the slide **25** and positioned parallel to the pads **115** and **116**.

The operation of the FIG. 13 embodiment is similar to that described for the embodiment shown in FIGS. 11

and 12. Normally the lever **119** is in contact with the roller support **121** so as to maintain a spacing between the rollers **118** and the pads **115** and **116**. However, after processed film containing envelope **91** has been started through the existing space, the lever **119** is released creating surface pressure on the straddled envelope. Thus, as the envelope is withdrawn, the retained film is first neutralized by contact with the pad **115** and then coated with an ultraviolet light filter by the pad **116**. As above, the lever **119** is engaged again before complete removal of the envelope so as to prevent smearing of the rollers **118**. With its retained film **92** having been fully neutralized and filter coated to prevent image deterioration, the aperture card **93** contained by the withdrawn envelope **91** can be used in a permanent information storage system without further processing.

Obviously, many modifications and variations of the present invention are possible in light of the above teachings. For example, the invention can be effectively utilized for processing other than aperture card mounted film. Also, although the illustrated, manually operated processor unit is desirable because of its simplicity, it will be obvious that the basic concepts of the invention could be incorporated into an automatic or semi-automatic device. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A photographic apparatus comprising:

(a) a light-tight housing adapted to receive photographic film;

(b) retainer means adapted to fix the photographic film in an exposure position within said light-tight housing;

(c) camera means adapted upon actuation to expose the photographic film;

(d) an applicator means positioned within said housing and adapted to support a layer of viscous processing reagent, said applicator means comprising a substationally flat surface movably mounted in a position substantially parallel to said fixed processing position of the photographic film; and

(e) actuator means adapted to apply the viscous processing reagent to the photographic film by producing reciprocal movement of said flat surface in a direction perpendicular thereto.

2. A photographic apparatus according to claim **1** including a conveyor means adapted to convey the photographic film from said exposure position to a fixed processing position wherein the viscous processing reagent is applied by said applicator means.

3. A photographic apparatus according to claim **2** wherein said light-housing is adapted to receive individual film frames mounted in aperture cards.

4. A photographic apparatus according to claim **3** wherein said conveyor means comprises a plate slidably engaged within said light-tight housing and extending through an exit slit therein.

5. A photographic apparatus according to claim **4** including a seal actuator means adapted in a closed position to light tightly seal said plate in said exit and in an open position to permit contact free removal of processed film frames.

6. A photographic apparatus according to claim **5** including a neutralizer means adapted to apply neutralizing reagent to processed film frames during their removal from said light-tight housing.

7. A portable photographic apparatus comprising:

(a) a light-tight housing adapted to receive separate individual frames of photographic film;

(b) retainer means adapted to fix each individual film frame in an exposure position within said light-tight housing;

(c) camera means adapted upon actuation to expose the film frame while in said exposure position;

(d) conveyor means adapted upon actuation to convey the film frame from said exposure position to a fixed processing position within said light-tight housing;

(e) applicator means adapted to support a layer of viscous processing reagent, said applicator means comprising a substantially flat surface movably mounted in a position substantially parallel to the fixed film frame; and

(f) actuator means adapted to apply the viscous processing reagent to the film frame while in said processing position by producing reciprocal movement of the flat surface in a direction substantially perpendicular thereto.

8. A portable photographic apparatus according to claim **7** wherein said light-tight housing defines a film well adapted to contain a plurality of separate individual frames of film, and including film supply means adapted after removal of one film frame from said exposure position to move another film frame from said film well into said exposure position.

9. A portable photographic apparatus according to claim **8** wherein said conveyor means comprises a plate slidably engaged within said light-tight housing and extending through an exit slit therein.

10. A portable photographic apparatus according to claim **9** wherein said light-tight housing further defines a viscous supply well adapted to contain a plurality of disposable, viscous processing reagent filled vessels.

11. A portable photographic film processor apparatus according to claim **10** wherein said applicator means further comprises a shallow vessel containing the viscous processing reagent, said shallow vessel having a removable top wall, side walls conforming generally to the periphery of the film frame, and a flexible bottom wall adapted to move said viscous processing reagent into contact with the film frame after removal of said top wall and in response to force exerted on said bottom wall by said flat surface during movement thereof.

12. A portable photographic film processor apparatus according to claim **11** wherein said shallow vessel includes a flange portion having an upper surface sealed to said top wall and adapted after removal thereof to engage a vessel retaining surface surrounding the film frame during movement of said flat surface.

13. A portable photographic apparatus according to claim **7** wherein said light-tight housing defines a film well adapted to contain a plurality of separate individual frames of film, and including film supply means adapted after removal of one film frame from said exposure position to move another film frame from said film well into said exposure position.

14. A portable photographic apparatus according to claim **13** wherein said conveyor means comprises a plate slidably engaged within said light-tight housing and extending through an exit slit therein.

15. A portable photographic apparatus according to claim **14** wherein said light-tight housing further defines a viscous supply well adapted to contain a plurality of disposable, viscous processing reagent filled vessels.

16. A portable photographic apparatus according to claim **15** wherein said applicator means further comprises a vessel support on which said vessel flange portion rests so as to support said vessel bottom wall directly adjacent said flat surface, and said actuator means is adapted to produce initial simultaneous movement of both said vessel support and said flat surface in a direction toward said film frame and after detention of said vessel support to produce further movement of said flat surface so as to forcibly flex said vessel bottom wall toward said film frame.

17. A portable photographic apparatus according to claim **16** including a fastening means for securing said vessel to said vessel support thereby insuring return of said vessel with said vessel support after release of said actuator means.

18. A portable photographic apparatus according to claim 7 wherein said light-tight housing is adapted to receive said individual film frames mounted in aperture cards.

19. A portable photographic apparatus according to claim 18 wherein said light-tight housing defines a film well adapted to contain a plurality of aperture card mounted film frames, and including film supply means adapted after removal of one film frame from said exposure position to move another film frame from said film well into said exposure position.

20. A portable photographic apparatus according to claim 19 wherein said conveyor means comprises a plate slidably engaged within said light-tight housing and extending through an exit slit therein.

21. A portable photographic film processor apparatus according to claim 20 wherein said applicator means comprises a substantially flat surface movably mounted in a position substantially parallel to the fixed film frame, and said actuator means is adapted to produce reciprocal movement of said flat surface in a direction substantially perpendicular thereto.

22. A portable photographic film processor apparatus according to claim 21 wherein said applicator means further comprises a shallow vessel containing the viscous processing reagent, said shallow vessel having a removable top wall, side walls conforming generally to the periphery of the film frame, and a flexible bottom wall adapted to move said viscous processing reagent into contact with the film frame after removal of said top wall and in response to force exerted on said bottom wall by said flat surface during movement thereof.

23. A protable photographic film processor apparatus according to claim 22 wherein said shallow vessel includes a flange portion having an upper surface sealed to said top wall and adapted after removal thereof to engage a vessel retaining surface surrounding the film frame during movement of said flat surface.

24. A portable photographic apparatus according to claim 23 wherein said light-tight housing further defines a viscous supply well adapted to contain a plurality of disposable, viscous processing reagent filled vessels.

25. A portable photographic apparatus comprising:

(a) a light-tight housing adapted to receive an aperture card mounted film frame;

(b) retainer means adapted to fix the aperture card mounted film frame in an exposure position within said light-tight housing;

(c) camera means adapted upon actuation to expose the film frame while in said exposure position;

(d) conveyor means adapted upon actuation to convey the aperture card mounted film frame to a fixed processing position within said light-tight housing;

(e) applicator means adapted to apply a processing reagent to the film frame mounted in the aperture card; and

(f) neutralizer means adaptd to apply neutralizing reagent to processed film frames during their removal from the light-tight housing.

26. A portable photographic apparatus of claim 25 wherein said applicator means comprises a substantially flat surface movably mounted within said light-tight housing in a position substantially parallel to said fixed processing position of the photographic film.

27. A portable photographic apparatus of claim 26 including an actuator means adapted to produce reciprocal movement of said flat surface in a direction perpendicular thereto.

28. A photographic apparatus according to claim 27 wherein said conveyor means comprises a plate slidably engaged within said light-tight housing and extending through an exit slit therein.

29. A portable photographic apparatus according to claim 27, wherein said light-tight housing defines a film well adapted to contain a plurality of aperture card mounted film frames, and including film supply means adapted after removal of one aperture card from said exposure position to automatically move another aperture card from said film well into said exposure position.

30. A portable photographic apparatus according to claim 29 wherein said conveyor means comprises a plate slidably engaged within said light-tight housing and extending through an exit slit therein.

31. A portable photographic apparatus according to claim 27 including a coating means adapted to automatically apply a light filter coating substance to processed and neutralized film frames during their removal from the light-tight housing.

32. A portable photographic apparatus according to claim 30 including a neutralizer means mounted on said plate and adapted to apply neutralizing reagent to processed film frames during their removal from said light-tight housing.

33. A portable photographic apparatus according to claim 32 wherein said neutralizer means comprises a neutralizer reagent soaked pad and pressure roller adapted to straddle the film frames during their removal from said light-tight housing.

34. A portable photographic apparatus according to claim 33 including a coating means adapted to automatically apply a light filter coating substance to processed and neutralized film frames during their removal from the light-tight housing.

References Cited

UNITED STATES PATENTS

2,435,720	2/1948	Land	95—13
3,350,990	11/1967	Finelli et al.	95—13

NORTON ANSHER, Primary Examiner

RICHARD L. MOSES, Assistant Examiner

U.S. Cl. X.R.

95—89