

[54] **FILM UNIT**

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[51] Int. Cl. **G03c 1/48**

[58] Field of Search **96/76, 29; 95/15**

[56] **References Cited**

UNITED STATES PATENTS

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[57] **ABSTRACT**

A photographic film unit of the self-processing type includes an image-recording portion with attached

fluid accommodating or reservoir means for supplying and collecting a processing fluid (e.g. a pod and trap). The fluid supplying means is initially in communication with the leading end of the image-recording portion, but is disposed in front of the image-recording portion (with respect to the direction of viewing the final print) during exposure and is movable relative thereto into substantially coplanar relationship therewith for processing. Thereafter, the fluid supplying means or reservoir is further movable with respect to the image-recording portion for improving the final appearance of the film unit after processing without generating any necessarily disposable waste by placing the supplying means behind the image-recording portion. The movable portion is substantially flat and, in accordance with one feature, is approximately equal in area to the area of the image-recording portion, to evenly cover the entire side of the image-recording portion opposite from the print-viewing side. The fluid collecting means is located within the borders of the film unit rendering its movement or removal after processing unnecessary.

Moreover, the present film unit is arranged to be completely and automatically formed in the camera so that no manipulation by the user is necessary after removal from the camera.

4 Claims, 4 Drawing Figures

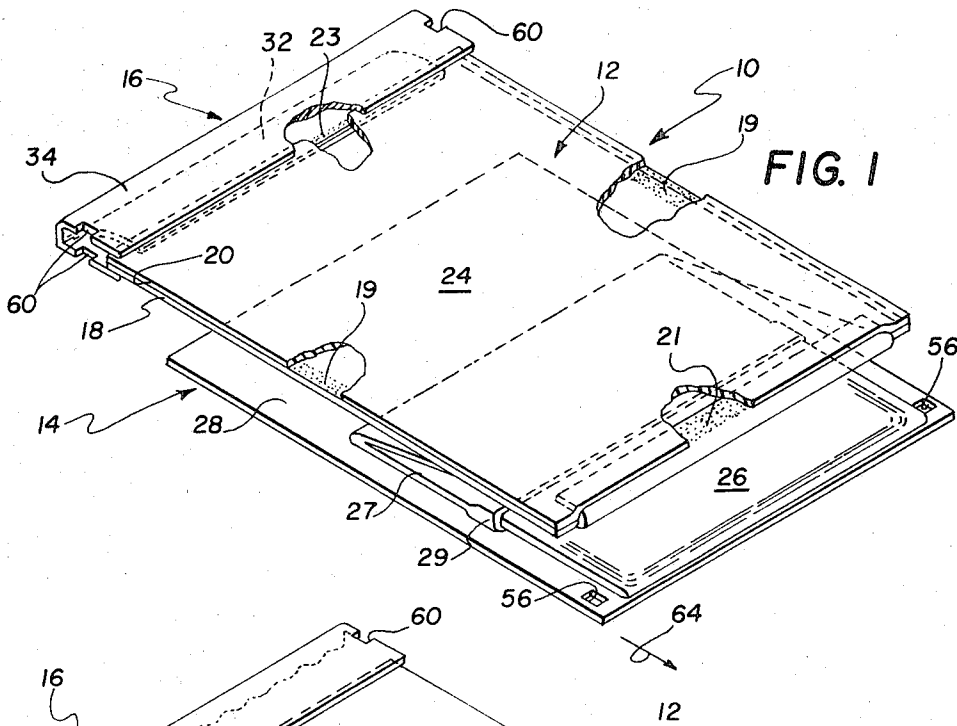


FIG. 1

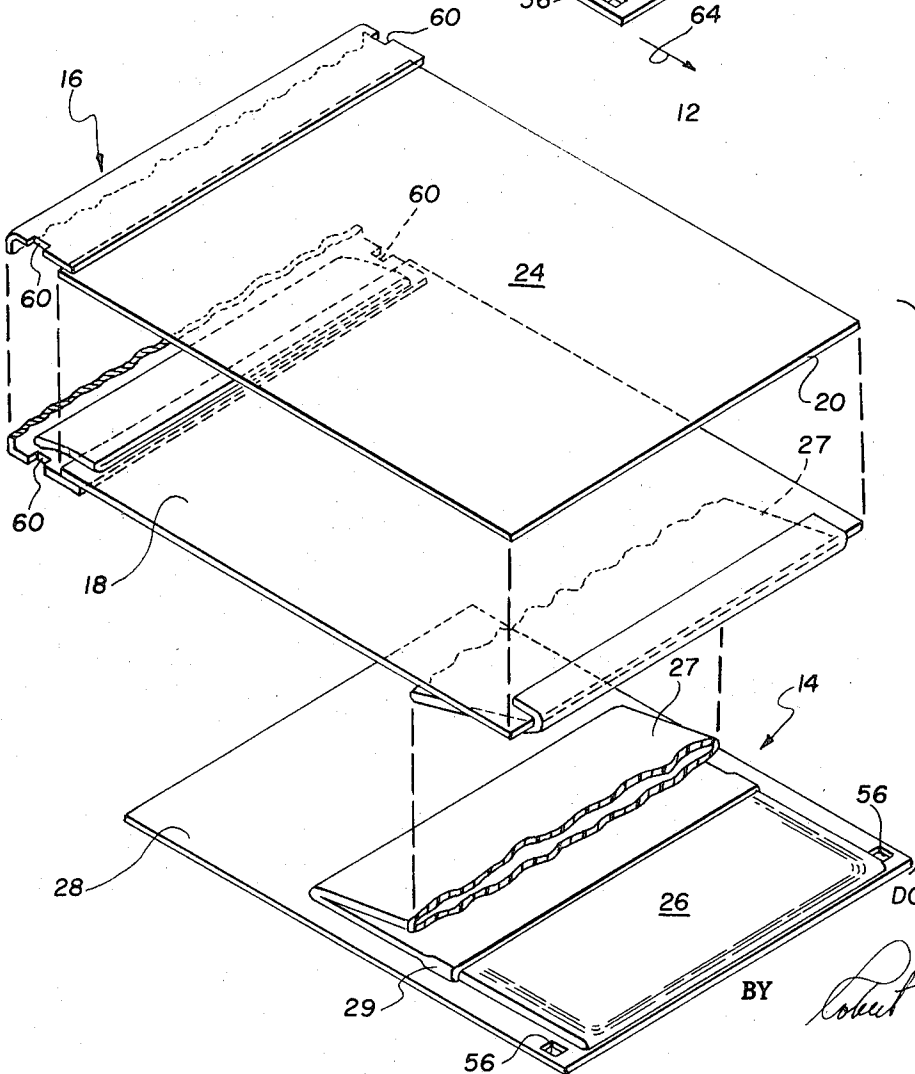


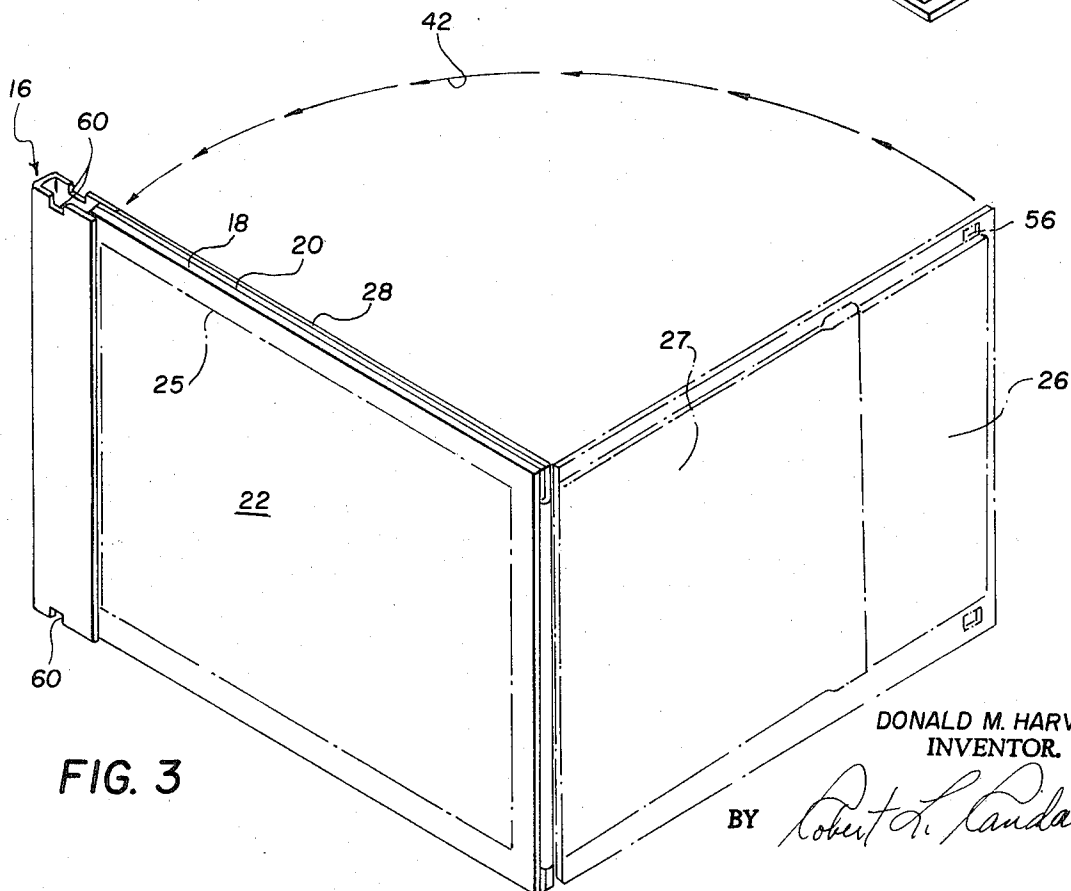
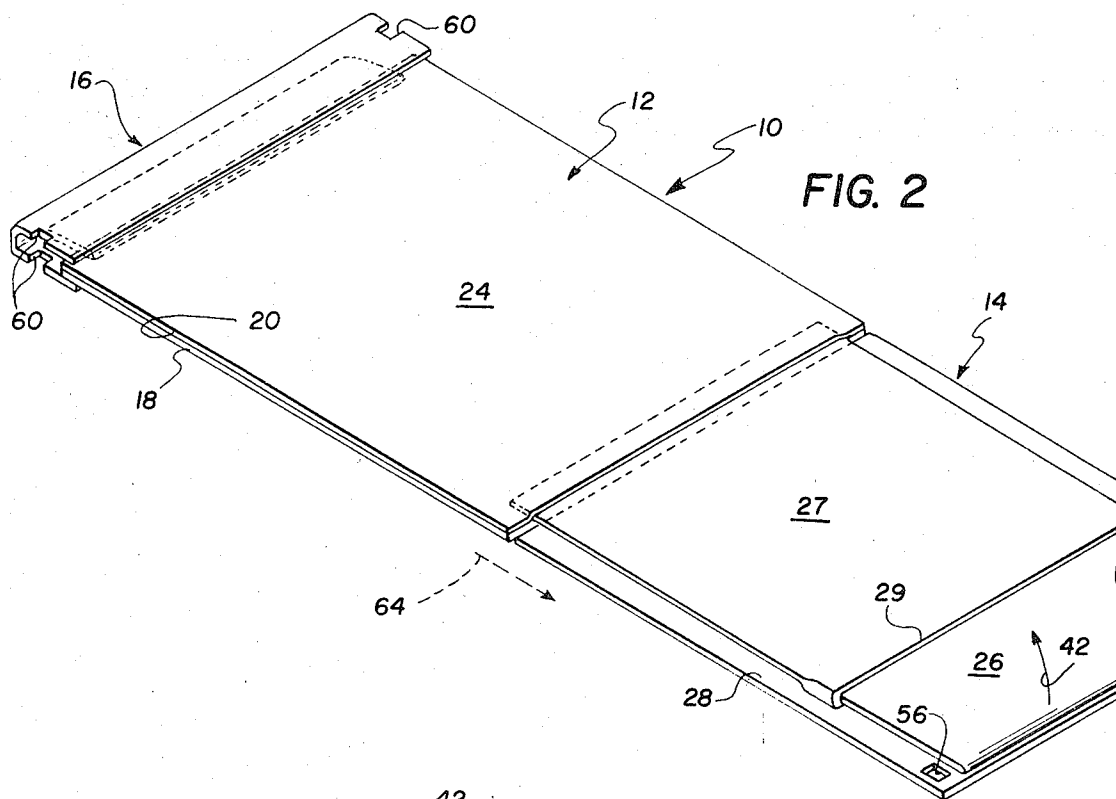
FIG. 4

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FILM UNIT

BACKGROUND OF THE INVENTION

The present invention relates to photographic film units of the self-processing type, and more specifically to such units including various fluid accommodating means, or reservoir means such as supply containers or pods, and collecting structures or traps, for handling processing fluids.

General Features and Forms of Self-Processing Film Units

While a self-processing film unit can take any of several different forms, they generally include an image-recording portion that is defined by a photosensitive element and a process sheet. The photosensitive element includes one or more radiation sensitive layers for recording a latent image that is processable to effect the establishment of a visibly presentable image, while the process sheet aids in the distribution of a fluid over the photosensitive element to effect such processing. The fluid accommodating or reservoir means, on the other hand, generally include a container in communication with the leading end of the recording portion for supplying the processing fluid, and a collector in communication with the trailing end for receiving any excess of the composition.

In operation, the film unit is moved through processing means that distribute the contents of the container in a layer of appropriate thickness between the photosensitive element and the process sheet, and direct any excess into the collector. The distributed processing fluid then permeates the radiation sensitive layers to effect processing of the latent image and establishment of the visibly presentable image.

In the most well known form of such film units, the process sheet is initially separated or spaced from the exposure side of the photosensitive element, to permit its exposure, and then is brought into a superposed or registered relationship with that side for processing. The visible image is established in an image-receiving layer associated with the process sheet, and that sheet is separated from the exposure side of the photosensitive element to define the final print. These film units can be referred to as being of a "post-registered" peel apart type in reference, respectively, to the initial and final relative positions of the photosensitive element and process sheet. "Post-registered" identifies the feature of registration after exposure, while "peel-apart" identifies the feature requiring removal of the process sheet to obtain the final print. An example of a post-registered, peel-apart film unit is illustrated and described in U.S. Pat. No. 3,080,805.

In other forms of self-processing film units, the photosensitive element and process sheet are registered or superposed prior to exposure, preferably at the time of manufacture, and remain in substantially the same condition during and after exposure and processing. Ordinarily the process sheet is transparent, to permit exposure of the photosensitive element, and that element remains permanently attached to the process sheet as part of the final print. These film units can be referred to as being of a "preregistered" and integral type, again referring to the initial and final relative positions of the photosensitive element and process sheet. Examples of this later type of film unit, wherein the image-receiving layer is most closely associated with the process sheet, are disclosed in U.S. Pat. No. 3,415,644 and in British

Pat. No. 1,224,372. Other examples, wherein the image-receiving layer is associated with the photosensitive element, are disclosed in commonly assigned U.S. Application Ser. No. 869,186 entitled PHOTOGRAPHIC FILM UNIT FOR DIFFUSION TRANSFER PROCESSING, and Ser. No. 43,322 entitled PHOTOGRAPHIC FILM UNIT, both filed in the name of H.E. Cole now U.S. Pat. No. 3,672,272.

The present invention is illustrated and described with a preregistered, integral film unit, and has particular utility therewith. However, certain of its features also might be applied to certain embodiments of peel-apart units.

Exemplary Problems Often Encountered With Previously Known Self-Processing Film Units

While self-processing film units offer several advantages over "conventional" film, they also involve several troublesome problem areas that have been the subject of intensive study. Moreover, this has continued to be the case even though at least several of the problems relate to ecology, consumer convenience, and/or other areas that are significant to the commercial success of this product.

By way of example only, considerable resources have been expended in attempts to provide improved means for handling certain materials such as the containers or pods and collectors or traps, that serve their primary function during processing and essentially comprise waste after that function is accomplished. As a result, numerous approaches have been presented that range from reliance on the consumer for proper separation and disposal of such materials, to the provision of camera mechanisms for automatically separating and collecting the waste materials.

Each of the above approaches has particular advantages, and generally operate satisfactorily for its intended purpose. However, each also suffers from certain disadvantages, at least under certain operating conditions. Reliance on the consumer to separate and properly dispose of waste materials permits substantial camera simplification and reduced costs, but is not considered to be very reliable in obtaining proper waste disposal. Separation and collection of the waste materials by various camera mechanisms can be nearly 100 percent reliable in collecting the waste materials, but normally requires more complex and expensive camera mechanisms, as well as increased size and bulkiness of the camera. Additionally, in almost all of the presently known film units where waste materials are intended to be separated from the final print, there is an added problem in that the processing fluid may leak from the waste materials or the print itself.

Still further, and referring now only to the presently preferred preregistered, integral film unit that is illustrated and described in previously mentioned U.S. Application Ser. No. 869,186, the back of the final print ordinarily must be a transparent material such as clear plastic, and may have an off-white or even mottled appearance from carbon black in the processing fluid. The plastic may make writing on the print difficult, and some consumers may find the color objectionable.

Heretofore, preregistered integral film units having an image-recording portion have been devised with a container or pod and collector or trap permanently attached to leading and trailing ends thereof, respectively, wherein one or both of the pod and trap are foldable to a position behind the image-recording portion

after processing has been initiated. These preregistered, integral film units have had a substantially flat element that is movable into engagement with the back side of the image-recording portion after processing has been initiated to enhance the properties of that side of the recording portion. See, for example, copending U.S. Application Ser. No. 178,235 entitled FILM UNIT and filed simultaneously herewith in the name of John A. Mathews.

However, in all such prior film units it has been considered necessary for the initial size of the film unit to be larger than the size of the final print by an area at least substantially equal to the area of the fluid accommodating or reservoir means, i.e. the area of the pod and/or the trap. This, of course, has dictated larger film pack configurations and larger camera sizes without increasing the size of the final print.

Moreover, while the above-identified applications disclose film units having a smaller initial size compared to the size of the final print, than that possible with other prior art arrangements, it still has been necessary for the user to perform several sequential folding steps in order to obtain the final print. It has been found that the fewer such steps that are necessary, the easier it is for the user and the better the customer acceptance of the product.

SUMMARY OF THE INVENTION

Accordingly, the present invention provides a self-processing film unit, which has an image-recording portion and a processing-fluid accommodating means that includes means movable relative to the image-recording portion from a first position, for supplying the processing fluid, to a second position that is substantially hidden from view. The fluid accommodating or reservoir means is arranged in the initial configuration of the film unit so that the initial area thereof is substantially equal to the final print size.

More particularly, the movable means is arranged so that only a single folding step must be performed to obtain the final print, and this can be automatically accomplished by a relatively simple camera mechanism as the film unit is ejected therefrom.

More particularly, the present invention provides a photographic film unit comprising a plurality of relatively stiff sheet-like sections, at least one surface of each being substantially planar. Relatively flexible means are arranged to connect the sections together, end to end, whereby the sections are movable into a position with the planar surfaces facing in the same direction. One of the sections constitutes an image-recording section including a photosensitive element for recording a latent image that is processable upon the application of a processing fluid thereto to establish a visible image. A layer covering the photosensitive element forms the front surface of the section at which such image is visible after processing. The outer surface of the layer constitutes the planar surface of the one section. The other of the sections is movable by virtue of the flexible connecting means longitudinally from juxtaposition with the front surface of the one section into substantially coplanar relationship therewith and then is movable into juxtaposed relationship with the back surface of the one section substantially in register therewith.

Further, the present invention provides a self-processing film unit wherein the processing-fluid ac-

commodating means remain after processing as a permanent part of the final print without detracting substantially from its aesthetic appearance.

One embodiment of the present invention provides a preregistered integral film unit having an image-recording portion with a container or pod and collector or trap permanently attached to leading and trailing ends thereof, respectively, wherein the trap is sufficiently small that it can be located within the borders of the film unit rendering its movement or removal unnecessary and the pod is foldable to a position engaging one side of the image-recording portion after processing has been initiated.

The present invention also provides a film unit of the above type wherein the foldable portion of the pod is substantially equal in area to the area of the image-recording portion.

More specifically, the present invention provides a preregistered, integral film unit of the self-processing type having a substantially flat element that is movable into engagement with one side of the image-recording portion after processing has been initiated to enhance the properties of that side of the recording portion.

A further object of the invention is to provide a preregistered, integral film unit having a trap with a thickness substantially equal to the final thickness of the film unit after the pod is folded, resulting in a film unit that has a uniform final thickness. Moreover, a film pack formed of a plurality of such film units also has a substantially uniform thickness.

The invention, and its objects and advantages, will become more apparent in the detailed description of the preferred embodiments presented below.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects and advantages of the present invention will become apparent to one skilled in the art from the following detailed description read in conjunction with the attached drawings wherein like reference numerals indicate like elements and wherein:

FIG. 1 is a pictorial view representing a single film unit partially expanded and partially in section, in its initial configuration in accordance with the present invention;

FIG. 2 is a pictorial view of the film unit depicted in FIG. 1, with the container extended for processing;

FIG. 3 is a pictorial view of the film unit depicted in FIGS. 1 and 2 with the container and collector completely folded in their final positions covering the back surface of the image-recording portion; and

FIG. 4 is an exploded pictorial view of the film unit in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, a preferred embodiment of the invention is illustrated, comprising a self-processing film unit 10 including an image-recording portion 12, and processing-fluid accommodating or reservoir means such as supply and collecting means 14 and 16, respectively.

The image-recording portion is adapted to record a latent image that is processable by a fluid or composition, and for this purpose is provided with a first or photosensitive element 18, that is suitable for supporting the latent image, and a second element or process sheet 20, for aiding in distributing the fluid over the element.

The supply and collecting means, on the other hand, provides the fluid for distribution, usually with some excess, and receives any such excess for storage or disposal after the distribution is completed. Thus, it should be apparent that the film unit includes all materials necessary for recording and processing a photographic image, when used in appropriate apparatus.

Image-Recording Portion

The preferred image-recording portion is of the pre-registered, integral type, wherein the process sheet 20 is permanently secured to the photosensitive element 18 along their lateral edges, and remains in substantially the same physical arrangement during exposure and after processing. Further details of such a recording portion are described and illustrated in commonly assigned, copending U.S. Application Ser. No. 70,836, entitled FILM UNIT, and filed on Sept. 9, 1970 in the name of H. Nerwin.

The photosensitive element 18 is formed of resiliently flexible materials and includes one or more radiation sensitive layers for recording the latent image as well as a mordant, or other appropriate layer, for receiving a visibly presentable image that is established during processing of the latent image. Since this element serves to support both the latent image and the visibly presentable image, it often is referred to as an integral negative-receiver.

The process sheet 20 also is formed of resiliently flexible materials, and cooperates with the photosensitive element 18 to provide a rectangular unit having straight edges and square corners, as well as other properties facilitating its handling in photographic apparatus. While the lateral edges of the sheet are permanently secured to the photosensitive element, such as by adhesively bonded areas 19, as previously mentioned, the central portions are resiliently separable to permit distribution of the processing fluid, and the ends are not bonded together but are bonded at 21 to the funnel 27 and at 23 to the trap 32 to permit introduction of the fluid between the element and sheet at the leading end and collection of any excess from therebetween at the trailing end. Further details of the photosensitive element and process sheet are described and illustrated in the aforementioned commonly assigned copending U.S. Application Ser. No. 869,186 now abandoned.

The preferred image-recording portion 12 is adapted to be exposed and viewed from opposite sides, with the image-receiving layer or mordant being located where it is visible (in the case of a reflection print) from a first side or surface 22 (FIG. 3), and the radiation sensitive layers being exposable from the opposite side or surface 24. Such viewing and exposure can be permitted by using transparent materials, both as a support for the image-receiving or mordant layer, and as the process sheet, to define the substantially clear protective coverings on both sides of the recording portion.

While the major area of the image-recording portion on the first side thereof is intended to be occupied by the final print 25 it also will ordinarily include a white and preferably uniform border that surrounds the peripheral portions of the print in a well known manner.

Although the present invention has particular utility with image-recording portions of the above described type, at least certain of its features also are applicable to other types, such as integral units that are adapted to be exposed and viewed from the same side, as dis-

closed in previously mentioned U.S. Pat. No. 3,415,644, or certain embodiments of peel-apart units.

Processing Fluid Accommodating Means

The preferred fluid accommodating means includes a supply means 14 for discharging the processing fluid between the photosensitive element 18 and process sheet 20 at the leading end of the unit, and a collecting mechanism 16 for receiving any excess of the fluid from therebetween at the trailing end.

The supply means can take many different forms ranging from those having many different parts with each serving separate functions, to those having only one or a few parts with each serving many functions. As illustrated, the supply mechanism encompasses three basic parts comprising a container or pod 26 of the processing fluid which is arranged to supply the processing fluid, a funnel or conduit 27 arranged to direct the fluid from the pod to the leading end of the image-recording portion between the photosensitive element 18 and process sheet 20, and a support or carrier 28 that also is adapted to serve as a covering element in a manner to be described hereinafter.

Container 26 can be of any suitable type known to those skilled in the art, and usually will include various vapor impervious and appearance-improving materials such as a plastic inner layer, a lead-foil intermediate layer and an outer paper wrapping, that contribute to provide a relatively stiff or nonresilient structure as compared to the image-recording portion. The container is sealed around its periphery to provide a cavity for the processing fluid, but is adapted to release that fluid from one edge upon the application to the container of a mechanical stress usually provided by juxtaposed pressure-applying members in related photographic apparatus in a manner well known in the art.

As is well known in the art, the funnel or conduit 27 is utilized to receive the fluid releasing edge of the container 26 therebetween as at 29, for directing processing fluid discharged from the container to the leading end of the image-recording portion with little or no possibility of leakage. The funnel is used to form the connection between the container 26 and the image-recording portion 12 and to permit the relative movement of such container and carrier between the respective positions illustrated in FIGS. 1, 2, and 3. The leading end of the funnel is attached to the carrier at the container and the trailing end is attached to the image-recording portion. The intermediate portion of the funnel, however, is not attached to either the carrier or the image-recording portion so as to permit longitudinal movement therebetween. Moreover, the funnel of the present invention is sufficiently elongated as to permit the longitudinal movement of the container between the respective positions illustrated in FIG. 1 and 2, i.e. from superposed relationship to substantially coplanar, end-to-end relationship.

The support or carrier 28 is constructed from relatively stiff material, such as paper or cardboard, and defines a substantially flat rectangular element having straight edges and square corners. For purposes to become more apparent hereinafter, the rectangular element has substantially the same length and width as the image-recording portion and subtends an area that substantially equals the area defined by the image-recording portion. The previously mentioned container 26 and the leading portion of the funnel are perma-

nently attached to one side of the carrier 28, and this side preferably is treated with a suitable material for facilitating such attachment, as well as for protecting the carrier from any of the processing fluid. The side of the carrier opposite from the container, on the other hand, provides a surface that is suitable for receiving ink or other writing materials to facilitate print identification.

The fluid collecting means or trap 16 is preferably of the rigid type located permanently within the borders of the film unit rendering its movement or removal after processing unnecessary. One example of such a trap construction is disclosed and claimed in my U.S. Application Ser. No. 178,046 entitled Fluid Receiving Means and filed simultaneously herewith. As disclosed in that application, the trap comprises an inflatable bladder 32 having an opening in the leading end thereof which is sandwiched or interposed between the trailing portion of the photosensitive sheet 18 and the process sheet 20. The bladder is formed of any suitable strong pliable material such as polyethylene or the like that is inert to the processing fluid. The processing and/or photosensitive sheets may be provided with staggered openings in the end portion thereof which permit the bladder to expand and yet provide structural strength and rigidity to the trap structure. Alternatively, the trap strength and rigidity may be provided by a rigid molded plastic structure attached to the trailing end of the image-recording portion. The bladder is preferably initially evacuated and limp so that the excess processing fluid from the trailing end of the image-recording portion is readily introduced into the bladder, causing it to expand to the extent necessary to accept the excess processing fluid.

Since the expandable bladder is soft and pliable it is necessary to provide a protective covering there to prevent inadvertent rupture thereof and any subsequent leakage. Thus, a rigid elongated shell-like cover 34 of substantially U-shaped cross section is provided which is slipped over the ends of the sheets 18 and 20. The cover is made of any suitable rigid material such as plastic and is preferably held in place by sealing the sides to the photosensitive and process sheets by any suitable means. Since the overall thickness of the trap assembly is slightly greater than the thickness of the laminated sheets, at least one of the top or bottom sides of the cover 34 may be provided with an inclined ramp at the leading end (not shown) for spreading the rollers and facilitating movement of the cover through the rollers. The cover not only provides a rigid surface that prevents the rollers from pressing on the filled bladder causing fluid in the trap to flow back between the photosensitive and process sheets to deleteriously affect the processing action, but it also provides a rigid, smooth surface upon which data may be recorded by the user.

It will be noted that with a trap assembly having a greater thickness than usual for such structures, the other dimensions, i.e. the length in particular, can be significantly reduced without a corresponding reduction in fluid capacity. Thus, this trap structure can remain as a permanent part of the final print without unduly detracting from the appearance thereof, and adding only slightly to the overall length. While this trap does have an increased thickness, this does not detract from the appearance of the final print and, as will become more apparent hereafter, actually enhances the appearance of the final print.

Additional Cooperating Features, and Operation of the Film Unit

The supply and collecting fluid accommodating means are permanently attached to the image-recording portion by suitable adhesives, or the like. Such adhesives are selected and applied to cooperate with the sealed lateral edges of the image-recording portion for providing a completely closed system, both during and after processing, that essentially eliminates any significant likelihood that the processing fluid will escape therefrom. This is not meant, however, to preclude any desirable escape from the system of water or other possible neutral components of the fluid.

Additionally, while the components of the fluid supplying means are illustrated in FIG. 1 as being spaced slightly from the image-recording portion, this is only for clarity, and in actual use are substantially contiguous therewith, with only the thickness of the pod 26 and funnel 27 therebetween.

When the film unit is intended for use in a camera utilizing picker members or fingers of the general type disclosed in U.S. Pat. No. 3,511,152, to initially remove the film unit from the pack and/or to feed the film unit between the pressure applying members, the leading end of the support 28 is provided with means such as openings 56 arranged, when the film unit is in its initial position in the film pack, to be engaged by the picker fingers. The leading edge of the support 28 is originally disposed slightly ahead of the leading edge of the image-recording portion to permit the picker finger to engage the openings 56. Thus the picker fingers are arranged to enter into the openings 56 and to move the fluid supply means 14 longitudinally of the film unit into engagement with the pressure members. To assure that the remainder of the film unit is not also moved longitudinally by the picker fingers, the trailing end of the lateral edges of the trap cover 34 is provided with notches 60 which engage a rib in either the film cartridge or the camera and prevent premature movement of the image-recording element.

Referring now to the operation of the film unit, it is intended to be supplied in the configuration illustrated in FIG. 1 with the supply fluid accommodating or reservoir means, including carrier 28, disposed adjacent and superposed with the first surface 22 of the image-recording portion 12. The funnel 27 is folded between carrier 28 and the first surface 22 of the image-recording portion and extends from the pod 26 to the leading end of the image-recording portion. The trap 34 is permanently connected to the trailing end of the image-recording portion. After exposure of the photosensitive element, the picker fingers, or other means, move the carrier 28 longitudinally of the film unit in the direction of arrow 64 to between a pair of juxtaposed pressure-applying members discharging the processing fluid from the pod 26 into the funnel 27, which is by then moved into coplanar relationship with the image-recording portion 12. As the supply means is moved further through pressure-applying members, such as by means of driven rollers, the funnel is completely straightened between the pod 26 and the leading end of the image-recording portion, facilitating the delivery of the processing fluid from the pod to the photosensitive element, and the longitudinal force is then directly applied to the end of the image-recording portion via funnel 27. While up to this time the frictional force between the carrier 28 and the image-recording portion

12 has not been sufficient to overcome the restraint provided by the engagement of notches 60 with the previously mentioned rib, the direct force applied to the leading end of the image-recording portion 12 by the funnel 27 in the direction of arrow 64 is sufficient to overcome the restraint provided by notches 60 and the image-recording portion and the attached trap are then pulled through the pressure-applying members, spreading the processing fluid over the photosensitive element and introducing the excess into the trap causing the bladder 32 to expand. At this point the film unit may be completely outside of the camera and will have a configuration substantially that shown in FIG. 2. Thus, the latent image is processed and the visible image is established by rupturing the container 26, distributing the processing fluid through the funnel 27 and between the photosensitive element 18 and process sheet 20, and collecting of any excess fluid in the collecting trap 34. As described in the previously mentioned U.S. Application Ser. No. 869,186, the processing fluid preferably includes an opacifier, that cooperates with an opaque layer in the photosensitive element, to permit immediate withdrawal of the film unit from the camera where processing is completed.

During processing and after removal from the camera, the trap provides a convenient appendage for handling the film unit without contacting the image-recording portion. After processing, however, the trap is sufficiently small that it does not detract from the aesthetic appearance of the finished print, at least insofar as photographers have become used to conventional prints having uniform borders.

When the present film unit is intended for use in a camera that is adapted to automatically fold the film unit as it is ejected therefrom, as disclosed in my co-pending U.S. Application Ser. No. 177,934 entitled PHOTOGRAPHIC APPARATUS, and filed simultaneously herewith, the carrier 28 is automatically folded in the direction of arrow 42 (FIGS. 2 and 3) after it passes through the pressure-applying members. The carrier is folded about the juncture of the carrier with the image-recording portion using the funnel 27 as a hinge until the carrier engages and is superposed with the back surface of the print. The fluid supply container 26, being supported on or being a part of the carrier, is also folded from the after-processing position, substantially coplanar with the image-recording portion, to the back surface thereof and is enclosed between the back surface of the image-recording portion and the carrier. In this manner the final print is ready for viewing upon the completion of processing without requiring any manipulation by the user.

Alternatively, the present film unit may be fed from the camera without being automatically folded, in which case it will have the configuration illustrated in FIG. 2. It is then a very simple matter for the user to manually perform the folding step to obtain the final print.

As previously noted, the trap structure has a thickness greater than the thickness of the image-recording portion. This additional thickness is preferably arranged to extend from the second surface 24 of the film unit. Thus when the carrier 28 is folded into engagement with this second surface after processing, the end thereof mates with the leading end of the trap structure to provide a final print having a substantially smooth back surface and a uniform thickness.

The border of surface 24 of the image-recording portion, and carrier 28 which is finally superposed therewith, are provided with a layer of cohesive that holds the film unit in the final configuration illustrated in FIG. 3. Alternatively, other adhesives may be used and, depending upon the type of adhesive, may be applied to only the areas noted above or to other areas. It will be noted, however, that with the use of the cohesives there is no problem of blocking, i.e. sticking together, of adjacent film units within the film pack since all of the cohesive areas on one film unit are isolated from any of the cohesive areas on an adjacent film unit.

As previously mentioned, the folding is facilitated by the flexible nature of the attaching elements along such lines. Additionally, the folding can be accomplished without adversely affecting any of the previously mentioned seals that provide a closed, substantially leak-proof system.

In accordance with particularly advantageous features of the invention, the foldable supply means is equal in length and width to the image-recording portion, and has an area equal to that of the image-recording portion, such that it cooperates in its final position to completely cover the second, back surface and to provide a smooth, flat back for the print. Moreover, the carrier serves as a cover for capturing the fluid container or pod 26 between the carrier and the second surface of the image-recording portion. In this manner, the appearance of the print is further improved and the sealed enclosure prevents the escape of any remaining fluid in the fluid accommodating or reservoir means.

More particularly, the elongated funnel 27 between the pod or container 26 and the leading end of the image-recording portion provides significantly improved fluid distribution to the photosensitive element, improving the uniformity of fluid supply thereto and the resulting image.

Still other advantages can be accomplished by selection of the materials or form of the supply means or its carrier. For example, in its final position, it can serve to stiffen the final print and to provide a convenient paper surface, or the like, to facilitate writing or the placing of other identifying indicium on the back of the print. Moreover, since it preferably is equal in area to the area of the image-recording portion, the container or pod can have relatively large peripheral dimensions with corresponding small or flat thickness dimensions while still having sufficient capacity to handle an appropriate amount of the processing fluid. This, in turn, facilitates the design of flat film packs and cameras for use with assemblages of the film units. Still further, the relatively stiff properties of the pods or its carrier facilitates its handling in the photographic apparatus.

It should now be apparent that the present invention provides a self-processing film unit having unique structural features and significant advantages not present in previously known units of this general type. Moreover, at least certain features of the invention have special utility and advantages in preregistered, integral film units, and especially when applied to such film units that are adapted to be exposed and viewed from opposite sides thereof.

More particularly, the present invention provides a film unit which, in its initial configuration, has a size substantially equal to that of the final print resulting in smaller film packs and cameras with the advantages in-

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herent therewith. This film unit is also adaptable to simple automatic manipulation by simple, inexpensive camera apparatus which permits the final print to be delivered from the camera without requiring any manipulation by the user. Moreover, as the final print emerges from the camera, the print surface is not covered or obscured by any portion of the film unit which must subsequently be removed by the user.

When all of its features are combined, the present invention can provide a substantially closed fluid handling system that substantially eliminates any probability of leakage with an initial configuration smaller than any film unit previously known, substantially equal in area to the area of the final print. Moreover, the various fluid accommodating means are accounted for after processing without requiring their separation from the rest of the film unit or having to accept their detracton from the aesthetic appearance of the final print. In fact, while such means previously were usually considered waste after processing had been initiated, in accordance with the present invention they can be utilized for handling the film unit during processing and for enhancing various properties of the print after its processing. Still further, the film units are particularly conducive to use with simplified camera mechanisms and relatively flat film packs and cameras.

The invention has been described in detail with particular reference to a preferred embodiment thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

I claim:

1. In a self-processing film unit comprising:
a substantially planar image-recording portion having leading and trailing ends, said image-recording portion including a photosensitive element for recording a latent image that is processable to establish a visible image viewable from a first surface of the

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image-recording portion, and a process sheet attached to the photosensitive element for aiding in the distribution of a processing fluid over said element to effect such processing;

fluid supplying means for supplying said processing fluid, said supplying means being rupturable for discharging said fluid; and

means for attaching said supplying means to the leading end of said image-recording portion and for directing said fluid, after it is discharged, to said leading end for distribution between said photosensitive element and process sheet, said attaching means including a funnel adjacent said leading end arranged to permit longitudinal movement of said supplying means between one position in juxtaposition with the first surface of said image-recording portion to a second position extending away from the leading end of and in substantially the same plane as said image-recording portion and to still another position against a second surface of said image-recording portion; the improvement comprising:

a fluid collecting means rigidly attached to the trailing end of said image-recording portion.

2. The self-processing film unit according to claim 1 wherein the back surface of said supplying means, when juxtaposed with the second surface of said image-recording portion, is substantially coplanar with the back surface of said fluid collecting means.

3. The self-processing film unit according to claim 1 wherein said fluid collecting means includes a flexible bladder for receiving fluid from said image-recording portion.

4. The self-processing film unit according to claim 3 wherein said fluid collecting means has a substantially rigid outer shell.

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