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MODULAR CAMERA HAVING REUSABLE COMPONENTS

Cross Reference to Prior Applications

This application claims the benefit of U.S. Patent Application No. 60/338,932 filed December 7, 2001 and U.S. Patent Application No. 60/365,069 filed March 15, 2002, which are hereby incorporated by reference in their entirety.

This invention relates generally to the field of photography, and more particularly to a low-cost single-use camera having components that may be reused.

Background of the Invention

In recent years, so-called disposable or single-use cameras, or by some as lens-fitted photographic film packages, have become increasingly popular. Typically, the single-use camera is a simple point-and-shoot type camera comprising a plastic main body portion which supports a fixed-focus taking lens, a film metering mechanism, a manual film advance thumbwheel, a single-blade shutter, a manual shutter release button, a frame counter for indicating the number of exposures remaining for picture-taking, a direct see-through viewfinder tunnel, and possibly an electronic flash unit. Front and rear plastic casing or cover portions

house the main body portion between them to form a light-tight camera unit. A decorative cardboard outer box contains the camera unit and has respective openings for the taking lens, the shutter release button, the film advance thumbwheel, the viewfinder tunnel, the frame counter, and a flash emission window.

5 At the manufacturer, the main body portion is loaded with a conventional 12, 24, or 36 exposure 35 mm film cartridge and the front and rear casing portions are connected to each other and/or to the main body portion to assemble the light-tight camera unit. Then, an exposed end of a supply spool in the main body portion is rotated to factory prewind substantially the entire length of the
10 unexposed filmstrip from the cartridge onto the supply spool. Lastly, the outer box is placed on the camera unit. After the photographer takes a picture using the single-use camera, he or she manually rotates the thumbwheel in engagement with a take-up spool inside the cartridge to rewind the exposed frame into the cartridge. The rewinding movement of the filmstrip the equivalent of slightly more than one
15 frame width rotates a metering sprocket in engagement with the filmstrip to decrement the frame counter to its next lower-numbered setting. When the maximum number of exposures available on the filmstrip are exposed and the filmstrip is completely rewound into the cartridge, the single-use camera is given to a photo-finisher. To access the film, the outer box is torn from the camera unit and
20 the rear cover is separated from the main body portion. The now exposed cartridge is removed with the filmstrip from the main body portion. Once the film cartridge is removed from the camera body, the filmstrip may be developed in a conventional manner to make slides or prints for the customer. The remaining camera parts are forwarded to the manufacturer for recycling, i.e. re-manufacture.

25 During recycling, all of the parts are inspected for wear and/or damage and replaced where necessary. The main body portion is re-loaded with a film cassette containing fresh film, and the front and rear casing portions are re-connected to each other and/or to the main body portion. The exposed end of the supply spool in the main body portion is again rotated to factory prewind
30 substantially the entire length of the unexposed filmstrip from the cartridge onto the

supply spool. Finally, a new outer box is placed on the camera unit and the camera is shipped out for another profitable resale. Although sales of these disposable cameras have been steadily increasing in the past years, there is always room for a “new look” camera having a different operation and/or different features to reach new markets and increase sales even further. Also, there is a need to create a modular disposable camera that allows for efficient assembly using suppliers of parts from different locations.

Also, much time and money is spent sending spent cameras back to a factory from retail stores and film-processing locations, to be overhauled, repackaged, and re-distributed back to the same stores. It would be desirable to make this process more efficient and practical.

Summary of the Invention

A single-use camera includes two main components - a large lens assembly, and a rear film cassette cartridge. The lens assembly essentially includes all of the components of the camera, except for the film, and the battery, and may be easily snapped onto a film cassette cartridge. Upon forced removal, the lens assembly is designed to survive, while the film cassette cartridge is destroyed, preventing the user from reloading the film. The lens assemblies may include any of a variety of features and effects, including drop-down filters and modifiers, flashes, sound effects, and selectively distorting lenses. Pre-loaded film packs may be supplied to retail stores and film-processing centers allowing returned cameras to be refurbished at the local-retail level, instead of collecting and shipping spent units back to the factory to be overhauled, repackaged, and re-distributed. According to another embodiment, the camera includes a pneumatic shutter release and a dark-slide panel that ensures a light-tight installation of the film cassette.

Brief Description of the Drawings

Fig. 1 is a top view of a modular camera, showing a large lens assembly connected to a film cassette assembly, according to the invention;

Fig. 2 is a front view of the modular camera of Fig. 1, according to the invention;

Fig. 3 is a front view of a film-advance mechanism located within the large lens assembly, showing details of a ring gear, a shutter release mechanism and a film-advance spring, according to the invention;

Fig. 4 is a front view of the film-advance mechanism, similar to the one of Fig. 3, showing positioning details of a lens, film canister, and a portion of a film strip, in relation to the ring gear, the shutter release, and drive sprockets;

Fig. 5 is a top view of the large lens assembly, showing details of a flash, the lens, a condenser, and a winding ring, according to the invention;

Fig. 6 is top view diagram of the film cassette assembly, showing a film canister, a film chamber, a battery chamber, and a film-advance spring, according to the invention;

Fig. 7 is a front view of the film cassette assembly of Fig. 6, according to the invention;

Fig. 8 is a top view of the film cassette assembly of Fig. 6, showing a break point for retrieving the film canister from the film cassette assembly;

Fig. 9 is an exploded assembly view of a camera according to another embodiment of the invention showing a lens unit, and a cassette unit that includes a dark-slide assembly;

Fig. 10 is a perspective view of the cassette unit, according to the invention;

Fig. 11 is a perspective view of the lens unit, according to the invention;

Fig. 12 is a perspective view of the assembled camera, according to the invention;

Fig. 13 is a perspective view of the cassette unit, showing details of the dark slide assembly, according to the invention;

Fig. 14 is a plan view of a dark-slide panel, according to the invention;

Fig. 15 is a plan view of the dark-slide panel adjacent to a guide frame used to receive the dark-slide panel, according to the invention;

Fig. 16 is a perspective view of the camera unit showing a light-tight lid for providing selective access to a film cartridge and/or a battery;

5 Fig. 17a is a perspective view of the guide frame combined with a view finder, according to the invention;

Fig. 17b is a perspective view of a lens chassis, according to the invention;

10 Fig. 17c is a perspective view of an outer winding mechanism, according to the invention;

Fig. 17d is a perspective view of an inner film-advancing mechanism, according to the invention;

15 Fig. 17e is a perspective assembly view of a flash assembly, including a reflector dish, a flash tube, a cover, and controlling circuitry, according to the invention;

Fig. 17f is a perspective view of a pneumatic shutter release mechanism, according to the invention;

Fig. 17g is a perspective view of several lens skins, of which one may be attached to the lens unit, according to the invention; and

20 Fig. 17h is a perspective view of an assembled lens unit, according to the invention.

Detailed Description of the Preferred Embodiments

Referring to Figs. 1 and 2, a camera 10 is shown including a very large front lens assembly 12 and a rear film cassette assembly 14. Film cassette assembly 14 is relatively simple in construction and includes a canister-receiving chamber 15 at one end which is sized and shaped to hold an appropriately sized canister of film 16, and a film spooling chamber 18 at an opposing end. Film spooling chamber 18 is sized and shaped to easily receive and temporarily store a supply of strip film 20 until the strip film 20 retracts into film canister 16, when all of

the pictures have been shot. A battery chamber 22 is preferably formed within film cassette assembly 14 so that it is centrally positioned within film spooling chamber 18 and it is sized and shaped to receive and hold a battery 24 used to power the flash, as described below. As strip film 20 enters into film spooling chamber, the film strip end actually advances loosely around battery chamber 22, and therefore also around an inserted battery 24. The purpose here is to minimize the size of camera 10 by creating value space for multiple uses, in this case, using a film spooling chamber 18 to both collect spooled-out film from canister 16 and to also hold a battery 24 used to power any onboard electronics, as described below.

Normally, in conventional single-use cameras, the film from its canister is completely transferred to a collection spool within the camera at the factory so that the eventual user of the camera actually exposes the film in reverse direction, effectively rewinding the film back into its canister each time a shot is exposed and the film is advanced (actually retracted).

Regardless, the user must manually wind the film to the next frame before taking another shot. In contrast, according to one embodiment, the present camera 10 introduces a coil spring 26 positioned below (or adjacent to) the film canister 16 within the film-cassette assembly 14. As strip film 20 is initially advanced to film spooling chamber 18, spring 26 is torqued and begins to introduce a spring bias to the strip film 20 to draw the film back to its canister 16. Preferably, spring 26 is strong enough and long enough to be able to pull the entire length of film 20 back to canister 16 so that the user merely has to depress a button to take a picture and to automatically advance the film to the next unexposed frame.

However, such a coil spring having such characteristics may not fit within the confined space within the camera and/or may be prohibitively expensive.

Therefore, Applicant contemplates using a spring 26 that can effectively retract a prescribed length of film 20 back into canister 16, such as, for example, 5 frames of film. As described below, the user may then "recharge" the spring 26 using an appropriate mechanical action (such as a wind up mechanism) so that its newly regenerated spring bias can retract another 5 frames of film (following the above

example). With this arrangement, the user of the camera can simply prepare the camera to provide automatic film advance for a prescribed number of frames, such as 5 frames. Considering the simplicity of a conventional single-use camera, any auto-advance feature would be a welcomed improvement.

5 As film strip 20 is displaced from canister 16 to the opposing film spooling chamber 18, it traverses across a film gate which, of course, is sized and shaped to expose a single (or perhaps several) frames of film when a shutter is opened, as is generally understood in the art of photography. At least one sprocket 30 mounted to a sprocket axle 32 is used to guide and hold film strip 20 in place,
10 against the action of spring 26 (or, if a spring is not used, at least one sprocket 30 is used to physically displace film 20 from spooling chamber 18 back into canister 16. Preferably two sprockets 32 are used, one positioned to engage the sprocket openings 34 positioned along each edge of conventional film 20, as shown in Fig. 7. Sprocket axle 32 preferably includes a drive slot (or other keyed recess) 36 at one
15 end that is accessible from outside the camera 10 so that loaded film 20 may be easily displaced, as desired, from its canister 16, at the factory. Preferably, sprocket axle 32 supports the shutter-release button 38, as shown in Figs. 3, and 4 and an appropriate clutching mechanism (not shown, but contemplated to resemble, in concept, the mechanism used in a conventional ball-
20 point pen to advance the pen tip from the handle and hold it there with a first press of a button, and thereafter retract the pen tip with a second press of the button), wherein the linear action of depressing shutter release button 38 releases the otherwise locked sprocket axle 32 so that film 20 may be disengaged and influenced by the bias of spring 26. In doing so, when a user merely depressed
25 shutter-release button 38 to take a picture, not only is a shutter mechanism 40 activated to permit the passage of light to pass from a lens element 42, through shutter 40 (for a prescribed period of time, usually 1/50 of a second) to expose an awaiting frame of film located at the film gate, but upon release of shutter-release button 38 (or perhaps during its initial depressing), the sprocket axle 32 is released
30 from engagement to a state wherein film 20 may be pulled by spring 26 (or

manually) into canister 16 to advance an adjacent unexposed frame of film 20 to the film gate, for the next shot.

Referring now to Figs. 3, 4 and 5, lens assembly 12 includes a generally cylindrical body 44, which may be secured to film cassette assembly 14, as described below, a front cover portion 46 which is secured to a front rim 48 of body 44, as shown in Fig. 5, and an interposed rotatable ring (or wind cog) 50 (shown in Figs. 1, 2, 3, 4, and 5). Lens assembly 12 houses several components of the camera 10, functioning somewhat, in effect, as the camera body. Lens assembly 12 houses the lens element 42 (introduced above), which may include one or more optical elements, including a protective cover to help prevent scratching the lens, the shutter mechanism 40, which may be conventional in structure and in operation, usually including a spring-biased, pivotally mounted plate that, upon activation moves from a first position wherein light entering through the lens 42 is blocked from reaching the film 20, to a second position, wherein the lens light is permitted to pass, and then returns to the first position, in a prescribed time period. Lens assembly 12 further houses a flash 52 (if one is used), a condenser or capacitor 54 (if one is used), and appropriate and required flash controlling circuitry (not shown), which is well known to those skilled in the art. The flash 52, condenser 54, and other controlling circuit (not shown) may be conventional.

According to the invention, lens 42 is mounted in an opening located at the center of front cover 46. Flash 52 (the bulb element) is mounted to the back side of front cover 46, preferably immediately adjacent to lens 42, as shown in Figs. 2 and 5 to help prevent "red-eye" from occurring when taking flash pictures of people (particularly those who tend to stare directly into the camera). The lens assembly further supports a view-finder assembly 56, which allows the user to optically frame a particular scene and which may be conventional in structure and function.

As introduced above, lens assembly 12 includes a rotatable ring or wind cog 50 which is rotatably positioned between cylindrical body 44 and front cover 46. Ring 50 preferably includes an easily gripped periphery 62, such as a

rubber coating or a band of rubber or suitable easy-grip plastic. Ring 50 includes a ring gear 64 (see Figs. 3 and 4) which is mechanically connected to sprocket axle 32 either directly or through an appropriate linkage, such as connector shaft 66, which includes an appropriate pinion gear 68 to engage with the teeth 70 of ring gear 64, and a second pinion gear 72 which is sized and shaped to engage a third pinion gear 74 mounted to sprocket axle 32, as shown in Figs. 3, and 4. With this arrangement, as a user rotates ring 50 of lens assembly 12, ring gear 64 rotates and causes connector shaft 66 to rotate (through first pinion gear 68) which, in turn, causes sprocket axle 32 to rotate (through pinion gears, 72, and 74). The purpose of ring 50 is to either manually advance (or cock) the film 20. If 26 is used to provide an auto-advance feature, rotation of ring 50 may be used to wind up spring 26, as described above. A larger, more powerful spring 76 may be positioned within lens assembly 12 and function similarly to previously described spring 26 (located adjacent to film canister 16), but may be larger and more powerful, owing to the larger environment provided by lens assembly 12.

As shown in Figs. 3 and 4, a canister hub drive element 80 is provided within canister-receiving chamber 15 and includes an engagement element 82 which is sized and shaped to key into the film spool of a conventional film canister 16. The purpose of canister hub drive element 80 is to communicate between spring 26 (if used) and the film spool (not shown) of a conventional film canister 16, allowing spring 26 (if used) to impart torque to film 20, as described above.

Camera 10 may further include a displaceable image modifier 84 which may be selectively moved between a stowed position, wherein light entering camera 10 can expose film 20 (assuming the shutter is open) without passing through modifier 84, and therefore without being modified, and a usable position, wherein light entering the camera 10 must pass through modifier 84 prior to reaching film 20. Modifier 84 may be one of several types of optical modifying elements including color filters, star-burst filters, soft-focus, mosaic, grain-effect type, or filters that modify passing light to impart characteristics of a painted image,

for example, so that a user could take a picture of a real-life scene, but record an image that appears as a painted version of the real-life scene. Regardless of the type of modifier used, modifier 84 may be fixed into a light-modifying, usable position, but is preferably pivotal, as described above, and may be pivoted using
5 any appropriate linkage, as would be understood by those skilled in the art.

Modifier 84 may also be slidable. Regardless of how it is moved, modifier 84 is preferably connected to an accessible lever 86 which allows the user of camera 10 to easily manipulate modifier 84 within the camera between its two positions, as desired. If the user sees a shot that might look better as a painted image, for
10 example, he can simple activate lever 86 to cause the painter-type modifier to move into the optical path from its stowed position, and later retract the same modifier, as desired.

Two other types of lens assemblies can be attached to the same film cassette assembly¹⁴. A first one includes a deformable lens assembly that may be
15 selectively squeezed to physically deform at least one optical component within the optical system so that the resulting image reaching the film will be a distorted version of the image entering the camera. This effect will introduce an unpredictable carnival-distorted-mirror (or cartoon-like) quality to the recorded images, which will, of course, offer new fun and excitement to using single-use cameras. With this
20 camera, the deformable lens assembly will preferably function as a normal lens when not squeeze, or otherwise activated. Additionally, a lens assembly that introduces a non-axially-symmetrical magnified lens assembly is contemplated wherein a lens that tends to magnify an image differently along a horizontal axis as it does in the vertical axis can be used to provide interesting effects to a recorded
25 image. For example, if the optical system allowed a slightly greater magnifying effect to incoming image light along the vertical axis, than along the horizontal axis, the resulting recorded images would be slightly stretched along the vertical axis, people would appear slightly taller, and thinner, and would result in happy customers all around because the camera would flatter their appearance. It is
30 understood that this feature may be most effective when the subjects are standing

and the camera is held in a predictable horizontal orientation. A weighted lens component which would ensure that the incoming image light would always be stretched along the vertical axis regardless of the orientation of the camera may also be used; however, the subjects would still benefit from the effect by standing.

5 Regardless of the features provided by lens assembly 12, it is affixed to film cassette body 14 in an appropriate mechanical manner, preferably using plastic “split-arrow” shaped elements that are received and secured within aligned openings of film cassette body 14. It is further preferred that forced separation of lens assembly 12 from cassette body 14 will cause irreparable
10 damage to cassette body 14, rendering it non-functional for secondary use (it becomes the disposed component of the camera). However, the entire lens assembly 12 including most of the camera’s components, as described above, remain intact and may be easily transferred to a new film cassette body loaded with a fresh canister of film. Film cassette body 14 may include additional “break points”
15 that encourage its own destruction upon attempts to remove the spent film canister 16 from within canister chamber 15.

 Since lens assembly 12 survives the recycling process, as many components of the camera 10 as possible, including all film drive and advance components may be mounted, even though several of these components are shown
20 in the drawings as being connected or mounted to film cassette body 14.

 Another feature of the invention is that lens assemblies 12 (having different features, as described above) may be supplied at retail stores and film-processing centers so that when a consumer returns his camera to the store to process the film, the film processor at the can simply snap off the lens assembly,
25 remove the film cartridge for processing, and snap the same lens assembly onto a freshly loaded film-cassette body 14, which was either supplied to the store in bulk by an authorized supplier, or a fresh empty body 14 was loaded with film by the store itself. This tightens up the recycling process and makes it more efficient. Furthermore, some of the resulting cost savings can be used to help persuade the
30 customer to purchase a freshly loaded camera. Most of the A “new” camera will

be the lens assembly 12, which the customer will know was the one he got to know as he exposed the first roll of film.

The modular lens assembly 12 will be appropriately sized and shaped so that it could be snapped within a larger housing according to a particular theme. For example, camera 10 could be snapped into a housing that resembles a
5 football to be passed out at a football game, or could be shaped like miniature wedding cake for weddings, or even shaped like a block of cheese to be used on “Cheese Day” (it’s a Wisconsin thing). Also, as a particular playful twist, a single use camera may be incorporated into a shell that is shaped like an expensive SLR
10 type camera, such as a Nikon F5. A simple sound-effects board could be introduced to create a funny sound each time the shutter button is activated, such as “Click” or a fancy motor-drive sound (as in the Nikon F5), or a funny voice, or wedding bells in the case of a wedding environment, or a football chant at the football game.

15 According to another embodiment of the invention, as shown in Fig. 9, a camera 100 is shown that includes modular components and is suitable as a so-called disposable or “single-use” camera. As shown in Figs. 10, 11 and 12, camera 100 is made up of two main components, a film cassette 102 and a lens unit 104. Lens unit 104 includes a chassis 106, a flash assembly 108, a lens assembly 110, a
20 shutter assembly 112, a manual winder assembly 114 and a lens skin 116.

Film cassette 102 includes a roll of film 118, a film-collection chamber 120, a film gate 122, a dark-slide assembly 124, a modifier assembly 126 (optional), and a view finder assembly 128.

As shown in Figs. 9, 13, 14, and 15, dark-slide assembly 124
25 includes a dark-slide panel 130 and a frame 132 including side guides 134 that are sized, shaped and positioned to snugly receive and guide the side edges of panel 130. Panel 130 is selectively slidable within frame 132 between a closed secure position, wherein light is prevented from reaching film gate 122, and an open usable position, wherein film gate 122 is open and any film located within film gate 122 is
30 exposed to any light passing through an open shutter. Dark-slide assembly 124

may be formed integrally with view finder assembly 128 to reduce the number of components.

The purpose of the dark slide assembly is protect film 118 located within cassette 102 from any light during storage and to provide a way to attach
5 cassette 102 to lens unit 104 while always maintaining a light-tight environment. In this manner, no film is wasted as a "leader" wherein in conventional cameras, typically several frames of otherwise usable film are lost or over-exposed during the film-loading procedure. Dark-slide panel 130 may be made from a rigid or soft flexible metal or plastic, paper, or a combination.

10 As described above, it is preferred that film cassette 102 be selectively attachable to lens unit 104 at a variety of retail locations (i.e., not necessarily at the "factory"), and/or attached at the consumer level. Upon attachment to lens unit 104 using an appropriate locking mechanism, cassette 102 is "activated" by pulling the dark-slide panel 130 down so that the film located within
15 film gate 122 becomes exposed to any light entering the camera and passing an open shutter. The panel 130 includes a keyed locking edge 136 that has locking elements 138 that are sized, shaped, and positioned to interlock within aligned locking openings 140 located at an appropriate location along side guides 134 so that when cassette 102 is mounted to lens unit 104, panel 130 may be pulled down
20 within side guides 134 until locking elements 138 of keyed locking edge 136 engage with locking openings 140. Once locked, panel 130 may be detached from locked keyed edge 136 along a frangible line of weakness 142. A modular locking mechanism (not shown) may be provided to cause a mechanical lock to occur between cassette 102 and lens unit 104 in response to withdrawing panel 130 from
25 its closed secure position. Alternatively, cassette 102 may be snap-fit into locking engagement with lens unit 104 using any appropriate locking mechanism (not shown in any great detail here). It is preferred however, that the locking mechanism used to secure lens unit 104 and cassette 102 together may be selectively released (using an appropriate tool inserted within an access opening, for example) or overcome by
30 force at which point select components making up the locking mechanism rupture,

fracture or otherwise yield along prescribed lines of weakness so that lens unit 104 may be repeatedly attached to new film cassettes, as necessary. Any components that are to break during separation of cassette 102 from lens unit 104 are either easily replaceable and/or break from the cassette portion, thereby leaving the lens unit 104 intact.

An important feature of the present invention is that a majority of the disposable camera 100 is re-used at either the retail level or even at the consumer level so that the camera does not have to be returned to the factory, taken apart, inspected, and reassembled into refurbished "new" cameras at each cycle of use.

When a user returns his/her camera to a qualified store-level film processor, the film processor removes the spent cassette 102 from the lens unit 104 and processes the exposed film in a conventional manner, then inspects the lens assembly and attaches a new film cassette 102 to the inspected lens assembly 104. Once the dark slide panel 103 is removed, as described above, the camera may be re-sold and new pictures taken. If the lens-unit fails inspection, it would be returned to the factory for appropriate repair.

According to the invention, once the keyed edge of the panel 130 engages within the locking openings, the keyed edge portion of the panel 130 serves to block light from the slot through which the panel was removed, and also serves to prevent (or at least discourage) unauthorized second party re-loading of film. It is preferred that once "activated" (i.e., panel 130 removed), the only way to reload film is to remove cassette 102 and the preferred way to remove cassette 102 is by force, which, as described above, breaks at least one component within the cassette 102, or perhaps within the lens-unit 104. The broken component(s) must be replaced before the camera will again either receive a new cassette or operate at all. The broken, or breakable component can be part of the film advance mechanism, described above, or any other primary and necessary system.

As shown in Fig. 13, an appropriate cog 146 is provided to communicate between film-advance mechanism located on lens-unit 104 and roll of film 118 when cassette 102 is attached to lens unit 104, as described above. Also,

appropriate electrical contacts connect flash circuitry (and other electronics) located within lens-unit 104 with battery 148 located within cassette 102, as described above.

5 According to Fig. 16, a light-tight lid 150 is located over film-collection chamber 120 and also over the opposing film cartridge-chamber so that portions of the film cassette 102 may be reused and the film cassette 102 may be easily refurbished (replacing the battery 148 and the roll of film 118) by merely removing the corresponding light-tight lids 150.

10 According to Figs. 17a- 17h, the individual components of lens unit 104 are shown, wherein the lens chassis 106 houses (or otherwise supports) the winding mechanism, described above, the flash assembly 108 which includes a large circular reflector 152, a flash tube 154, and appropriate circuitry 156. Lens skin 116 preferably snaps to a portion of lens unit 104 and covers a sizable portion thereof and is used to either directly support or encase a design, pattern, logo or
15 any visual medium so that camera 100 may be quickly and easily configured with any of a variety of designs and patterns (following different themes), either at the factory, retail store, or consumer level. Cassette unit 102 can similarly include skins (not shown) that can be used to quickly and easily introduce custom or unique designs and patterns to the cassette portion 102 of camera 100.

20 According to another feature of the present invention, a pneumatic shutter release mechanism 158 is provided, and includes a shutter button 160, a send piston 162, a connection tube 164, and a receive actuator 166. Shutter button 160 is a piston and operates in a cylinder 168 that includes a spring (not shown) that biases the shutter button 160 outwardly. Cylinder 168 is in fluid communication
25 with connection tube 164. Furthermore, connection tube 164 is in fluid communication with receive actuator 166, which is, in turn, mechanically connected to the conventional shutter mechanism.

Shutter button 160 includes a central opening 170 that is sized and shaped to easily be sealed by a user's finger when the finger is placed on the button.
30 The central opening 170 is in fluid communication with the cylinder 168 so that

when a user's finger is placed over the button 160, and the button 160 is depressed, a prescribed amount of air becomes trapped within cylinder 168 and is forced along connection tube 164. The resulting pressure generated within connection tube 164 is exerted within actuator 166 and causes the actuator to

5 mechanically translate the applied air-pressure into mechanical movement, which in turn, activates the shutter to release. By using air pressure to activate a camera's shutter, much of the inherent last-instant camera shake is avoided (or at least minimized) through the cushioning-effects of the air, so that sharper images will result on film. Also, since the central opening 170 must be covered to create the

10 air-pressure that will ultimately activate the shutter, the camera will not accidentally take a picture while stowed in a purse, for example, or while being carried-only when the user's places their finger on the shutter and depresses it.

Claims:

1 1. A single-use camera, comprising a lens assembly and a film
2 cassette cartridge, means for connecting the lens assembly to the film cassette
3 cartridge for use as a camera, whereby separation of the two to gain access to the
4 film destroys the cartridge.

1 2. A single-use camera according to claim 1, wherein said
2 cartridge includes a film cannister chamber, a film chamber and a battery chamber
3 within said film chamber.

1 3. A single-use camera according to claim 1, further include
2 spring means for advancing the film each time a photograph is taken.