

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN AND RELATING TO CAMERAS

(71) We, AGFA-GEVAERT AKTIEN-GESELLSCHAFT, a body corporate organised according to the Laws of Federal Rep. of Germany, of Leverkusen, Federal Rep. of Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to cameras.

The invention provides a camera comprising a first body part and a second body part, the parts being slidable relative to each other laterally with respect to the optical axis of the camera objective between a retracted position and an extended, picture-taking, position, one or more camera components in the first body part being covered in the retracted position and uncovered in the extended position, the second body part including a first arm extending parallel to the direction of sliding movement at the front of the camera and a second arm extending at right angles to the first arm, the second arm being hollow so as to cover an end portion of the first body part when the body parts are in the retracted position, and the arrangement of parts being such that the film chamber is accessible from the back of the camera, at least when the body parts are in the extended position.

The arrangement of the said arms in the manner stated has *inter alia* the advantage that a covering for the end portion of the first body part is provided while permitting, at least in the extended position, access to the film chamber from the back of the camera without interference from the said arms. In addition, the body parts are simple to hold (the dimensions of the second arm can be chosen to enable it to be grasped easily), and can be guided accurately and easily relative to each other.

Advantageously, there is provided a rod extending in the direction of sliding movement and secured to one of the body parts, for assisting the guiding of the body

parts during the said sliding movement; such a guiding means facilitates accurate guiding and ease of relative movement between the body parts. The use of a rod guide gives an extended, accurate and easy motion guiding action. The rod may be located in the vicinity of the first arm. The regions of sliding engagement defined by the apertures may be made of plastics material, and the apertures may be defined by two or more eyelets spaced apart on the length of the rod. Preferably, the rod is secured to the second body part. Preferably the rod extends substantially the whole length of the first arm.

There is advantageously provided a rack on or proximate the axis of the rod, the rack being parallel to the direction of sliding movement and fixed with respect to the second body part, and the rack being arranged to co-operate with a gear system on the first body part, for example, a film transport gear system. The rack may be mounted on the rod by means of lugs, and there may be provided in the second body stop members to fix the position of the rack relative to the second body part.

Advantageously, there is provided additional guide means spaced apart from the axis of the rod in a direction parallel to the optical axis of the camera objective. The arrangement of guides spaced apart in this direction enables the camera to be made compact in a direction normal to the plane containing the optical axis of the objective and the direction of sliding movement. Conveniently, the rod is located in the vicinity of the first arm and the additional guide means is provided at the end of the second arm that is adjacent the back of the camera. The additional guide means may comprise a projection provided on one of the body parts which runs in a groove on the other. The contact in the additional guide means between the body parts may be confined to a region that is shorter (preferably much shorter), in the direction of sliding movement, than the rod.

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Advantageously, the said one or more camera components that are covered in the retracted position consist of or include any one or more of the following components, namely, the camera objective, the viewfinder eyepiece, the viewfinder objective.

Advantageously, the camera is elongate in the direction of the sliding movement. Preferably, the camera is, at least when retracted, of substantially uniform and substantially rectangular section in a direction normal to the plane defined by the optical axis of the camera objective and the direction of sliding movement, the depth of the camera in the said direction normal to the said plane being less than its dimensions over the rectangular section. The profile of the second arm may be U-shaped in planes normal to the optical axis of the camera objective. The first arm may also be hollow and have a U-shaped profile in planes normal to the direction of sliding movement. The film chamber may be located at the first body part, and the cover for the film chamber may be coupled to the first body part. The two body parts may be spring-biased into the extended position and there may be provided a catch for releasably holding the parts in the retracted position.

Advantageously, the camera is elongate in the direction of sliding movement, there is provided a longitudinal guide for the second body part, the longitudinal guide being parallel and extending along the first arm, and the longitudinal guide is formed by a rod secured to the second body part, which rod is guided in lugs secured to the first body part. Preferably, there is provided a toothed rod proximate and fixed with respect to the longitudinal guide, the toothed rod co-operating with film transport gears in the camera.

One form of camera constructed in accordance with the invention will now be described, by way of example, with reference to the accompanying drawing which is a partially broken view, in perspective, of the camera.

Referring to the accompanying drawing, a camera includes a first body part 1 on which is provided a shutter release 2 and, at the rear of the camera a film chamber cover 3, and a second body part in the form of a slider 4. The parts 1 and 4 are slidable relative to each other in direction 7 laterally with respect to the optical axis of the camera objective, between the retracted position illustrated in the Figure and an extended position where the slider 4 projects beyond the end of the body part 1. The extended position is the picture-taking position, and the camera is retracted when not in use. In its retracted position, the

slider 4 acts as a cover for one end portion of the first body part and for parts of the camera such as the viewfinder or objective. The slider 4 also acts as a film transport member, film transport being effected in response to the sliding movement of the slider. Movement of the slider 4 also serves to cock the shutter and rotate a flash cube socket, although these functions can be performed by other means if desired.

The slider 4 must on the one hand be accurately guided and yet be easy to move, particularly since it is responsible for effecting film transport and possibly other functions as well. For this reason the slide is L-shaped, one arm 4a extending along one of the longer sides of the camera 1, and the other arm 4b extending along a shorter side of the camera 1. Both arms are hollow and of U-shaped profile, and, in the retracted position, cover an end portion and a front portion of the first body part 1. The arrangement of the said arms has *inter alia* the advantage that, while providing a covering for parts of the first body part, they do not prevent access to the film chamber (via the cover 3) from the back of the camera. As a result of the shape of the slider, it is possible to guide the slider 4 in the longitudinal direction over its entire length, for example, by means of a guide rod 5, which extends into one side of the arm 4b. A second guide, for example, a groove 1b co-operating with a tongue 4c is arranged on the other side of the shorter arm 4b so that the slider 4 is guided at positions spaced well apart over its width and cannot tilt as it is moved. A good and accurate tongue and groove guide is simple to produce in plastics housing members, the groove 1b being provided in the first body part 1 and the tongue 4c on the slider 4 engaging in the groove 1b.

A guide rod for the slider 4 is particularly simple to assemble if the slider 4 is provided along one edge of the arm 4a with three lugs 4d, 4e and 4f and if in the first body part two eyelets (in the form of lugs) 1c and 1d associated with these lugs 4d, 4e and 4f are provided. For assembly, the slider 4 and first body part 1 are brought together in their desired position, and then the rod 5 is pushed through the associated bores of the lugs 4d, 4e, 4f, 1c and 1d, and fixed in this position to the slider 4.

Arranged between the lug 1c in the camera and the lug 4e in the slider 4 is a spring 6 which tends to urge the slider 4 into the extended position, so that the camera is then ready for taking a photograph or for film transport. If the film is to be transported, the slider 4 is moved in the direction of the arrow 7 into the position shown in the drawing, and then released again. Under the action of the spring 6 it is

then moved in the opposite direction to that of the arrow 7, into the extended position again, from which, after operating the shutter release it is possible to perform a further film transport operation. A suitable locking device is provided in the first body part, which, when the camera is not being used, makes it possible to selectively lock the slider 4 in the closed position covering the body part 1, but which does not lock when the shutter is repeatedly and successively recocked.

The rod 5 is also used to couple to the slider 4 the gear members necessary for film transport, thereby providing a particularly simple design. A toothed rod 8 for effecting film transport via gear wheels 9 in the camera is provided for this purpose. The toothed rod 8 is in the form of a plastics member which includes two lugs 8a and 8b. The toothed rod 8 is arranged so that the lug 8a lies between the lugs 4d and 1d, and the lug 8b lies to one side of the lug 4e. On moving the slider 4 in the opposite direction to that of the arrow 7, the toothed rod 8 is moved together with the slider 4, because it is held between the lugs 4c and 4d, but it is not hindered by the lug 1d. On actuating the slider 4 in the direction of the arrow 7, the toothed rod 8, which is thus also guided by the rod 5 which extends through the lugs 8a and 8b, is driven along by lug 4d until the slider is arrested by the lug 8a meeting the lug 1d. The outer stop position of the slider 4 is conversely reached when the lug 4f meets the lug 1c.

Other forms of camera which are not shown in the drawing for the sake of simplicity, are possible. Thus, for example, another tongue and groove or a roller guide could take the place of the rod guide.

WHAT WE CLAIM IS:—

1. A camera comprising a first body part and a second body part, the parts being slidable relative to each other laterally with respect to the optical axis of the camera objective between a retracted position and an extended, picture-taking, position, one or more camera components in the first body part being covered in the retracted position and uncovered in the extended position, the second body part including a first arm extending parallel to the direction of sliding movement at the front of the camera and a second arm extending at right angles to the first arm, the second arm being hollow so as to cover an end portion of the first body part when the body parts are in the retracted position, and the arrangement of parts being such that the film chamber is accessible from the back of the camera, at least when the body parts are in the extended position.

2. A camera as claimed in claim 1,

wherein there is provided a rod extending in the direction of sliding movement and secured to one of the body parts, the rod being slidable in at least one aperture in the other of the body parts, for assisting the guiding of the body parts during the said sliding movement.

3. A camera as claimed in claim 2, wherein the rod is located in the vicinity of the first arm.

4. A camera as claimed in claim 2 or claim 3, wherein the regions of sliding engagement defined by the apertures are made of plastics material.

5. A camera as claimed in claim 4, wherein the apertures are defined by two or more eyelets spaced apart along the length of the rod.

6. A camera as claimed in claim 2, wherein the rod is secured to the second body part.

7. A camera as claimed in claim 6, wherein the rod extends substantially the whole length of the first arm.

8. A camera as claimed in any one of claims 2 to 7, wherein there is provided a rack on or proximate the axis of the rod, the rack being parallel to the direction of sliding movement and fixed with respect to the second body part, and the rack being arranged to co-operate with a gear system on the first body part.

9. A camera as claimed in claim 8, wherein the gear system is a film transport gear system.

10. A camera as claimed in claim 8 or claim 9, wherein the rack is mounted on the rod by means of lugs, and there is provided in the second body part stop members to fix the position of the rack relative to the second body part.

11. A camera as claimed in any one of claims 2 to 10, wherein there is provided additional guide means spaced apart from the axis of the rod in a direction parallel to the optical axis of the camera objective.

12. A camera as claimed in claim 11, wherein the rod is located in the vicinity of the first arm and the additional guide means is provided at the end of the second arm that is adjacent the back of the camera.

13. A camera as claimed in claim 11 or claim 12, wherein the additional guide means comprises a projection provided on one of the body parts which runs in a groove on the other.

14. A camera as claimed in any one of claims 11 to 13, wherein the contact in the additional guide means between the body parts is confined to a region that is shorter, in the direction of sliding movement, than the rod.

15. A camera as claimed in any one of claims 1 to 14, wherein the said one or more camera components that are covered



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then moved in the opposite direction to that of the arrow 7, into the extended position again, from which, after operating the shutter release it is possible to perform a further film transport operation. A suitable locking device is provided in the first body part, which, when the camera is not being used, makes it possible to selectively lock the slider 4 in the closed position covering the body part 1, but which does not lock when the shutter is repeatedly and successively recocked.

The rod 5 is also used to couple to the slider 4 the gear members necessary for film transport, thereby providing a particularly simple design. A toothed rod 8 for effecting film transport via gear wheels 9 in the camera is provided for this purpose. The toothed rod 8 is in the form of a plastics member which includes two lugs 8a and 8b. The toothed rod 8 is arranged so that the lug 8a lies between the lugs 4d and 1d, and the lug 8b lies to one side of the lug 4c. On moving the slider 4 in the opposite direction to that of the arrow 7, the toothed rod 8 is moved together with the slider 4, because it is held between the lugs 4c and 4d, but it is not hindered by the lug 1d. On actuating the slider 4 in the direction of the arrow 7, the toothed rod 8, which is thus also guided by the rod 5 which extends through the lugs 8a and 8b, is driven along by lug 4d until the slider is arrested by the lug 8a meeting the lug 1d. The outer stop position of the slider 4 is conversely reached when the lug 4f meets the lug 1c.

Other forms of camera which are not shown in the drawing for the sake of simplicity, are possible. Thus, for example, another tongue and groove or a roller guide could take the place of the rod guide.

WHAT WE CLAIM IS:—

1. A camera comprising a first body part and a second body part, the parts being slidable relative to each other laterally with respect to the optical axis of the camera objective between a retracted position and an extended, picture-taking, position, one or more camera components in the first body part being covered in the retracted position and uncovered in the extended position, the second body part including a first arm extending parallel to the direction of sliding movement at the front of the camera and a second arm extending at right angles to the first arm, the second arm being hollow so as to cover an end portion of the first body part when the body parts are in the retracted position, and the arrangement of parts being such that the film chamber is accessible from the back of the camera, at least when the body parts are in the extended position.

2. A camera as claimed in claim 1,

wherein there is provided a rod extending in the direction of sliding movement and secured to one of the body parts, the rod being slidable in at least one aperture in the other of the body parts, for assisting the guiding of the body parts during the said sliding movement.

3. A camera as claimed in claim 2, wherein the rod is located in the vicinity of the first arm.

4. A camera as claimed in claim 2 or claim 3, wherein the regions of sliding engagement defined by the apertures are made of plastics material.

5. A camera as claimed in claim 4, wherein the apertures are defined by two or more eyelets spaced apart along the length of the rod.

6. A camera as claimed in claim 2, wherein the rod is secured to the second body part.

7. A camera as claimed in claim 6, wherein the rod extends substantially the whole length of the first arm.

8. A camera as claimed in any one of claims 2 to 7, wherein there is provided a rack on or proximate the axis of the rod, the rack being parallel to the direction of sliding movement and fixed with respect to the second body part, and the rack being arranged to co-operate with a gear system on the first body part.

9. A camera as claimed in claim 8, wherein the gear system is a film transport gear system.

10. A camera as claimed in claim 8 or claim 9, wherein the rack is mounted on the rod by means of lugs, and there is provided in the second body part stop members to fix the position of the rack relative to the second body part.

11. A camera as claimed in any one of claims 2 to 10, wherein there is provided additional guide means spaced apart from the axis of the rod in a direction parallel to the optical axis of the camera objective.

12. A camera as claimed in claim 11, wherein the rod is located in the vicinity of the first arm and the additional guide means is provided at the end of the second arm that is adjacent the back of the camera.

13. A camera as claimed in claim 11 or claim 12, wherein the additional guide means comprises a projection provided on one of the body parts which runs in a groove on the other.

14. A camera as claimed in any one of claims 11 to 13, wherein the contact in the additional guide means between the body parts is confined to a region that is shorter, in the direction of sliding movement, than the rod.

15. A camera as claimed in any one of claims 1 to 14, wherein the said one or more camera components that are covered

in the retracted position consist of or include any one or more of the following components, namely, the camera objective, the viewfinder eyepiece, the viewfinder

5 objective.
16. A camera as claimed in any one of claims 1 to 15, wherein the film transport means is arranged to be actuated in response to the sliding movement.

10 17. A camera as claimed in any one of claims 1 to 16, wherein the camera is elongate in the direction of the sliding movement.

15 18. A camera as claimed in claim 17, wherein the camera is, at least when retracted, of substantially uniform and substantially rectangular section in a direction normal to the plane defined by the optical axis of the camera objective and the direction of sliding movement, the depth of the camera in the said direction normal to the said plane being less than its dimensions over the rectangular section.

20 19. A camera as claimed in claim 18, wherein the profile of the second arm is U-shaped in planes normal to the optical axis of the camera objective.

25 20. A camera as claimed in claim 19, wherein the first arm is hollow and the profile of the first arm is U-shaped in planes normal to direction of sliding movement.

30 21. A camera as claimed in any one of claims 17 to 20, wherein the film chamber is located in the first body part, and the cover for the film chamber is coupled to the first body part.

22. A camera as claimed in any one of claim 1 to 21, wherein the two body parts are spring-biased into the extended position, and there is provided a catch for releasably holding the parts in the retracted position.

23. A camera as claimed in any one of claims 1 to 22, wherein the camera is a still camera.

24. A camera as claimed in claim 1, wherein the camera is elongate in the direction of sliding movement, there is provided a longitudinal guide for the second body part, the longitudinal guide being parallel and extending along the first arm, and the longitudinal guide is formed by a rod secured to the second body part, which rod is guided in lugs secured to the first body part.

25. A camera as claimed in claim 24, wherein there is provided a toothed rod proximate and fixed with respect to the longitudinal guide, the toothed rod co-operating with film transport gears in the camera.

26. A camera substantially as hereinbefore described with reference to, and as shown in, the accompanying drawing.

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