Feb. 25, 1958 W. C. HOFFMASTER 2,824,491

FILM HOLDER

Filed April 3, 1956

FIG. 1

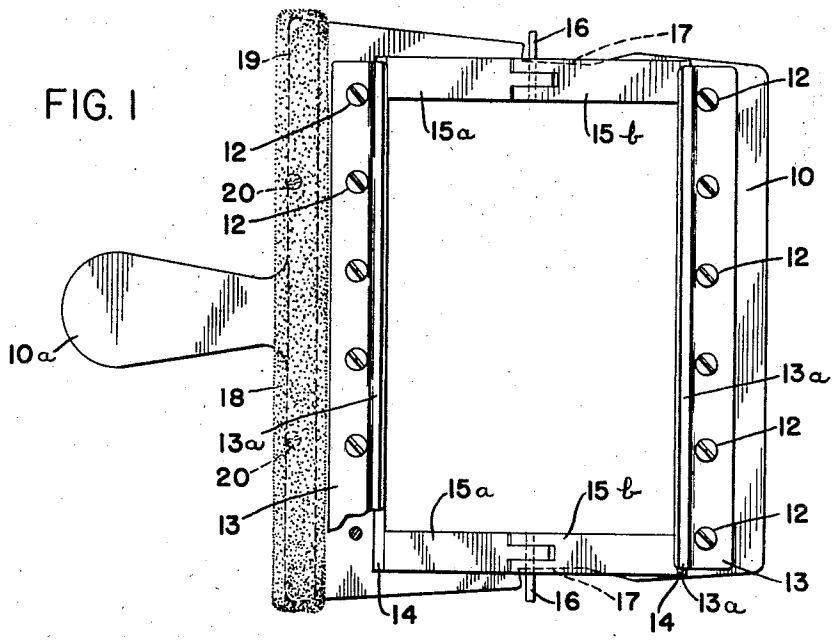


FIG. 2

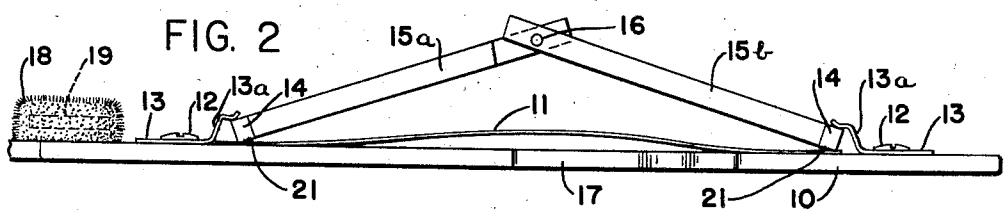
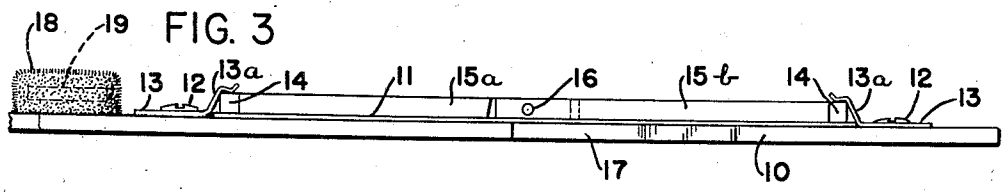


FIG. 3



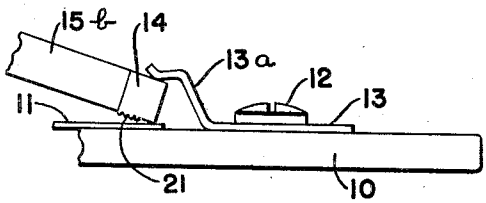


FIG. 4

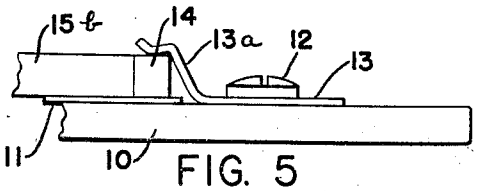


FIG. 5

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FILM HOLDER

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5 Claims. (Cl. 88—24)

This invention relates to film-holding devices and is especially advantageous for holding a film in a flat condition, without requiring any glass plate, in an enlarging camera of the type that prints a relatively large picture from a smaller film negative.

Its chief objects are to provide facility of operation, simplicity and economy of construction, compactness of structure, and durability.

Of the accompanying drawings:

Fig. 1 is a plan view, with a part broken away, of a film holder embodying the invention in its preferred form, the holder being in a horizontal position for mounting of the film in it.

Fig. 2 is an elevation of the same, on a larger scale, from the near side of the holder as it appears in Fig. 1, but illustrating an earlier stage of the mounting of the film.

Fig. 3 is a corresponding elevation but illustrating the holder with the film fully flattened therein, in condition for use of the assembly in the camera or the like.

Fig. 4 is a fragmentary elevation on a larger scale of parts as they appear in the early-stage showing of Fig. 2.

Fig. 5 is a large-scale elevation of the same parts as they appear in the later-stage showing of Fig. 3.

The holder, in its preferred form here shown, comprises a plane faced, generally rectangular base frame **10** defining a rectangular light passage that is slightly narrower and preferably is slightly shorter, than the film, **11**, that it is to hold.

Secured to the upper faces of the longitudinal elements of the base frame, as by screws **12, 12**, are respective strips **13, 13** of resilient sheet metal presenting toward each other L-shaped, over-hang, hold-down flanges **13***a*, **13***a*.

The holder comprises also a generally rectangular toggle structure, separable from the base frame, said structure comprising a pair of lengthwise extending film-gripping and tensioning bars **14, 14** which are parallel with each other and at each end of the holder are connected by toggles, each consisting of moving strut arms **15***a*, **15***b* rigidly connected to the respective bars **14** and hinged to each other at their tonge-and-slot inner ends by a pin **16**. These pins project outwardly from the respective hinges to provide finger grips for lifting the toggles and below each pin the base frame is cut away as at **17, 17** to permit the operator's fingers to be easily inserted under the projecting parts of the pins when the toggles are in their flattened condition.

The base frame **10**, cut in its entirety from a piece of sheet metal of uniform thickness, is integrally formed with a handle **10***a* for facility of manipulation. On the upper face of the rectangular frame, adjacent the handle, is mounted a light-seal which is provided by a strip of pile-fabric **18** wrapped about and adhered to a sheet-metal strip **19** and secured to the base frame **10** by screws **20, 20** extending through the base frame and threaded into the metal strip.

For mounting the film **11** in the holder the toggle

structure **14, 14, 15***a*, **15***b* is removed from the base frame **10** and the film is laid upon the frame with its four margins slightly overlapping the corresponding elements of the base frame. The toggle structure, in "broken" condition, is then simply laid upon the film, with its elements **14** resting upon respective opposite margins of the film and thus supporting the toggle structure.

The toggle structure is then flattened, by manual downward pressure of its arms **15***a*, **15***b* to act as moving struts and thus cause its elbows, which causes its elements **14, 14** to move apart and wedge into their holding positions under the overhang parts of the respective resilient hold-down flanges **13***a*, **13***a*, and in doing so the elements **14** press the respective margins of the film against, and slide them outward upon, the base plate **10** and thus tension and flatten the film. Also the toggle arms **15***a*, **15***b*, as they come into alignment, flatten the end margins of the film by direct downward pressure, and then hold the said margins flattened against the base frame, by direct pressure contact.

To provide good pulling engagement of the elements **14** with the film, the lower, film-engaging faces of the said elements preferably are roughened, as indicated at **21, 21**, Figs. 2 and 4.

To give the toggle structure stability in its fully flattened condition the hinge-pins **16, 16** are positioned as near as possible to the lower faces of the arms **15***a*, **15***b* and the resilient hold-down flanges **13***a*, **13***a* are so shaped, as shown, that, when the toggle is fully flattened, they apply horizontal forces to the toggle bars **14, 14** only at positions that are farther from the base plate than is the axis of the hinge pins **16, 16**, which is to say that the pins **16, 16** go "past center" in the full flattening of the toggle, and of the film, against the base frame.

Modifications are possible within the scope of the invention as defined in the appended claims.

I claim:

1. A film-holder comprising a base frame formed with a light passage defined on at least two opposite sides by margins of the frame adapted to receive margins of the film in overlapped relation to them respectively, a toggle structure formed with a light passage defined on at least two opposite sides by elements of said structure adapted to engage the said margins of the film, the two said light passages being unobstructed substantially throughout the extent of the image area of the film to be held, and resilient hold-down means mounted on said base frame for directly engaging the said elements and pressing them and the said margins of the film against the base frame and thereby tensioning the film as an incident of movement of the said elements away from each other in the flattening of the toggle structure.

2. A film-holder comprising a base frame having two spaced apart surface areas adapted to receive in directly contacting overlapped relation to them respective opposite margins of the film to be held, means for anchoring one of the said margins to the one of the said areas that so receives it, and, for tensioning the said film, hold-down means mounted on said frame at the other one of said areas and having a resilient part spaced therefrom and thus defining therewith a space for receiving a margin of the film and a film-tensioning element overlying it, a film tensioning element adapted to overlie said margin of the film in direct contact therewith and to crowd said resilient part of the hold-down means away from said base frame in being moved into position between them while in overlying relation and in direct contact with a margin of the film, and means for so moving said film-tensioning element.

3. A film-holder as defined in claim 2 in which the defined hold-down means is a strip of material formed with an over-hang flange as its defined resilient part.

4. A film-holder as defined in claim 2 in which the means for moving the film-tensioning element into position as defined is a film-contacting, rigid, wedging member.

5. A film-holder as defined in claim 1 in which the defined toggle structure comprises a pair of toggle arms hinged directly to each other and shaped to flatten a margin of the film against the base frame by direct contact of said arms with the said margin in the flattening of the toggle structure, the defined hold-down means comprising parts exerting against the defined elements opposed components of force parallel to the film-contacting faces of the said arms when the toggle structure is fully flattened, and the said toggle arms having their hinge axis nearer to the film contacting faces of said arms than are said parts, so that the toggle structure resists being flexed when it is in fully flattened condition in its film-holding relationship.

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