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LENS HOODS FOR PHOTOGRAPHIC CAMERAS

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Fig. 1

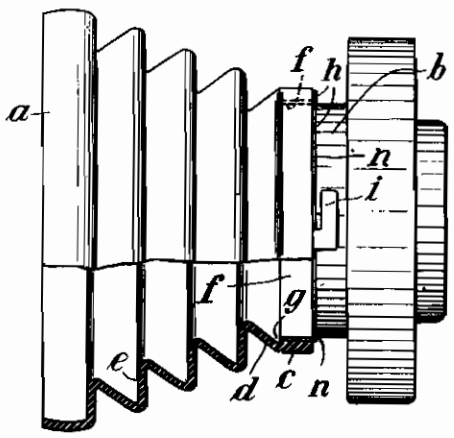


Fig. 2

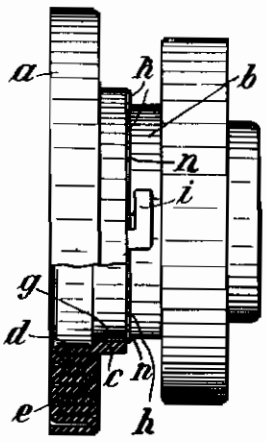


Fig. 3

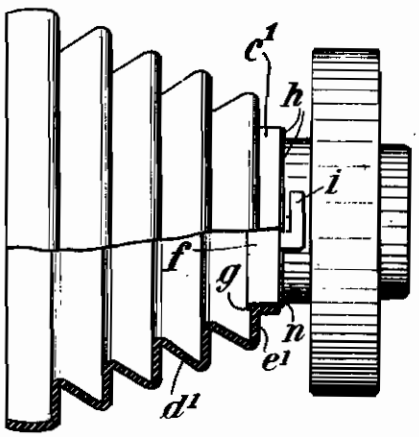
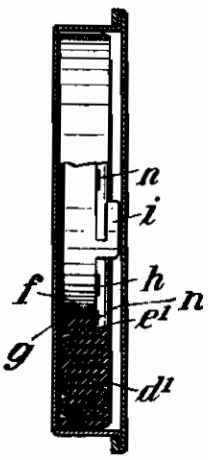


Fig. 4



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ALIEN PROPERTY CUSTODIAN

LENS HOODS FOR PHOTOGRAPHIC CAMERAS

Max Ruhland, Brunswick, Germany; vested in the Alien Property Custodian

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My invention relates to improvements in lens hoods for photographic cameras, and more particularly in hoods of the type comprising an expansible and collapsible hood made from elastic and flexible material such as soft rubber and in the form of conical bellows adapted to be placed with their end of smaller diameter on the lens mount of the camera. One of the objects of the improvements is to provide a hood of this type which may be readily collapsed into a shape such that the folds of the bellows overlie one another in radial direction. Another object of the improvements is to provide a hood in which the extended position light rays falling on the inner surface of the hood are reflected outwardly and so that they do not pass through the lens. With these objects in view my invention consists in constructing each fold composing the bellows of the hood from a part that when the hood is in extended position extends substantially in a transverse plane perpendicular to the axis of the structure and a part which extends from the inner margin of said perpendicular part outwardly and towards the end engaging the lens mount, the part of the innermost fold having a conical shape approximating a cylinder, or extending outwardly from the lens mount and substantially in the said transverse plane.

I am aware that it has heretofore been proposed to construct hoods for camera lenses of the type indicated above, in which the folds of the bellows are composed each of a conical part extending from the inner or smaller side of the hood outwardly and a conical part extending inwardly from the outer margin of said outwardly extending part. Thus, to the incoming rays conical surfaces are presented which are adapted to reflect the said rays inwardly and to the lens. Further, in the said known structure the inner part of the innermost fold extends from the margin of the lens mount inwardly at an angle to the axis of the structure approximating 90°, so that when the hood is collapsed the said innermost part is pressed into a position perpendicularly to the said optical axis thus providing a support on which the folds arrange themselves so as to overlie one another in axial direction.

For the purpose of explaining the invention an example embodying the same has been shown in the accompanying drawing in which the same reference characters have been used in all the views to indicate corresponding parts. In said drawing,

Fig. 1 is an elevation partly in section showing the hood in extended position and engaging the lens mount,

Fig. 2 is a sectional elevation showing the hood in collapsed position,

Fig. 3 is a sectional elevation similar to the one illustrated in Fig. 1 and showing a modification, and

Fig. 4 shows the collapsed hood incased.

In the example shown in Figs. 1 and 2 the hood comprises a body *a* in the form of conical bellows and made from elastic and flexible materials such as soft rubber, the said hood engaging the lens mount *b* with its innermost annular member *c*. Following the said innermost annular member the body *a* comprises a series of folds of successively increasing diameter, and each fold comprises a part *d* in the form of an obtuse cone and extending from its inner margin inwardly at an angle to the axis of the structure approximating zero, and a part *e* extending from the outer margin of said conical part *d* outwardly and in a plane substantially transverse and perpendicular to the said axis of the structure. The bellows consist of a single piece of flexible material, so that all the folds and their parts are made integral.

In the extended position of the hood incoming rays impinging on the inner wall of the hood are reflected outwardly and laterally and so that they do not pass through the lens. Therefore the sensitized film is not impaired by rays of diffuse light. When the hood is collapsed the transverse parts *e* are bent inwardly by the axial stress acting thereon and they place themselves on the conical parts *d* which are slightly bent outwardly and into cylindrical shape. Finally the folds arrange themselves in the position shown in Fig. 2 in which they overlie one another in radial direction. As appears from the said figure, the breadth of all the parts *d* and *e* is alike, and therefore the folds are collapsed into annular space bounded at both sides by planes perpendicular to the axis of the structure.

The modification shown in Fig. 3 is similar to the one so far described. But as distinguished from the construction shown in Figs. 1 and 2, the first part e_1 of the first fold connected with the innermost ring c^1 extends outwardly and substantially in a transverse plane perpendicular to the axis of the structure, and the second part d^1 extends from the outer margin of said perpendicular part inwardly and towards the outer part of the hood. I have found that thereby the collapsing of the hood is effected even more readily, for the reason that in the construction shown

in Figs. 1 and 2 the innermost conical part *d* has the tendency by axial stress exerted on the hood to be pressed into a plane perpendicular to the axis of the hood so as to lie flat on the front side of the lens mount, and the said tendency must be counteracted by the transverse member *e* being pressed inwardly and onto the outer face of the member *d*, while in the construction shown in Fig. 3 the transverse member e_1 has no tendency, and it is pressed inwardly and onto the outer surface of the portion c_1, and the conical part d_1 is pressed on the said transverse part e_1. Further, the collapsed folds overlie the annular member c_1, while in the construction shown in Figs. 1 and 2 they overlie the innermost part *d*. Therefore, in the construction shown in Fig. 3 the axial length of the collapsed hood is smaller than that of the construction shown in Figs. 1 and 2.

In both constructions the annular member *c* is fixed to a ring *f* of sheet metal which is formed with a flange *g* and prongs *h* engaging the end faces of the annular member *c*, c^1, with inwardly projecting prongs *n* and with spring flaps *i* engaging the outer circumference of the lens mount *b*.

When the hood is placed on the lens mount it is held thereon by the clamping action of the spring flaps *i*, and its inward movement is limited by the inwardly projecting prongs *n* bearing on the end face of the lens mount.

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