

## PATENT SPECIFICATION



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## COMPLETE SPECIFICATION

## Photographic Camera for Three-Colour Photography

We, OPTIKOTECHNA SPOLECNOST S.R.O., PREROV, of Prerov, Czechoslovakia, a Body Corporate organised and existing under the laws of Czechoslovakia, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 This invention relates to a photographic camera for three-colour photography, having an optical system adapted to yield three component negatives.

15 A modern camera for colour photography should have the following features: small over-all dimensions, short focal length of the lens, ability to use the film effectively, a single lens by means of which the component negatives are illuminated by a single exposure, a simple optical system adapted to yield at least three component negatives, low cost of manufacture, and ability to yield exactly equivalent component negatives. The main object of this invention is to provide a camera having these features.

25 In order to use the film effectively the three component negatives must be formed one immediately adjacent another in a single rank along the film, and previously proposed optical systems for attaining this object and consisting of complicated arrangements of prisms or mirrors, involved relatively long light paths, which made the camera too bulky and costly when employed for negatives of small dimensions. The exposure of the component negatives alongside one another in the same plane introduced particularly serious difficulties.

40 The photographic camera according to this invention is provided with an optical system adapted to divide a light beam, which passes through a lens disposed at the front of the system, for the purpose of yielding three component negatives with a single exposure, and is characterised in that the optical system comprises prisms which have two partly reflecting and a third totally reflecting surface and which are so shaped and disposed that all said reflecting surfaces are parallel to each other, and that the

system is adapted to form three component negatives disposed immediately adjacent one another on one film while equivalent optical paths are provided for each of the light beams divided out by the optical system.

60 The prisms are conveniently cemented together to form a unit having two arms disposed at right angles to each other, one of said arms of the unit consisting of two prisms which are provided with the parallel partly reflecting boundary surfaces arranged one behind the other on the optical axis of the lens, while the other of said arms has the totally reflecting surface; and the film may be so arranged, for example by being positioned by means of guide rollers of known type provided in the camera, that it turns in zig-zag manner in three directions successively at right angles to one another, the individual portions of the film so bent forming respectively surfaces for the exposure of the component negatives.

80 A constructional example of the photographic camera according to the invention is shown in the accompanying drawing.

Fig. 1 shows the camera diagrammatically with the guiding means for the film.

85 Fig. 2 shows in perspective both the arrangement of the prisms and the component negatives on the film.

90 In Fig. 1 O is the lens, and A, B, C are the prisms which are cemented to form a unit and constituting two arms which are at right angles to one another, the one arm consisting of the two prisms B, C and the second arm being formed by prism A. The boundary surfaces 1—1, 2—2 of these prisms are partly silvered, while the end surface 3—3 is completely silvered.

95 The light beam passes through the lens O and falls upon the first silvered surface 1—1; it is directed partly on to the surface 3—3 from which it is reflected directly on to the sensitive emulsion of the film. The second part of the light beam passes through the surface 1—1 and is divided by the partly silvered surface 2—2 and falls on the sensitive emulsion of the film

[Price 1/-]

F. The third part of the light beam passes through the surface 2—2 and falls directly on the sensitive emulsion of the film. At all places the light rays are completely equal as regards their length not only through the glass but also through air, so that the images are geometrically absolutely identical and in consequence no errors can arise in the colour reproduction.

It is known that each individual colour filter gives a different exposure. In order to secure component negatives of uniform density it is necessary to equalise the colour filters. Such equalisation has unfavourable effects on the properties of the filter for it is necessary to make the filter weak in colour to secure exposure times in the ratio 1:1:1. Consequently the absorptive capacities of these filters are so weakened that the component negatives, which form the basis for the further necessary operation, do not possess such good properties as are necessary.

In the arrangement according to the present invention there are employed such three-colour filters as are spectroscopically free from objection. Uniform intensity of the negative is obtained by a corresponding density of silvering of the boundary surfaces of the individual prisms in the optical system which is employed in the photographic camera according to this invention.

The density of silvering is such that at the corresponding place only so large intensity is reflected as is required by the appropriate filter. The light is automatically divided in appropriate proportion for each individual negative with a single exposure by the optical system.

The described system divides and reflects the light beam in such a manner that a single film employed as the negative receives all three component negatives N1, N2, N3 which are disposed adjacent to one another (Fig. 2).

The guiding of the film is evident from Fig. 1, the film F being turned twice through a right angle. The rollers *a, h, i* provide for the feeding and the guiding of the film. The film is wound by rotating the spool in the casing K2 so that the film is drawn from the casing K1 over the guide rollers *g, h, i*.

The three-colour filters *d, e, f* are placed near the film F so that the distance between the film and the parallel surfaces of the prisms is only slightly larger than is necessary for the insertion of the filters. Complete sharpness of all three component negatives is assured by this arrangement of the filter close to the film.

The arrangement described and shown

represents obviously only one constructional example of the invention whose individual features can be altered within the scope of the invention. For example there can be employed, in place of the prisms, mirrors which as regards density of silvering are made similar to the boundary surfaces of the above described prisms A, B, C.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. Photographic camera for three-colour photography, having an optical system adapted to divide a light beam, which passes through a lens disposed at the front of the system, for the purpose of yielding three component negatives with a single exposure, characterised in that the optical system comprises prisms which have two partly reflecting and a third totally reflecting surface and which are so shaped and disposed that all said reflecting surfaces are parallel to each other and that the system is adapted to form three component negatives disposed immediately adjacent one another in a single rank along the film while equivalent optical paths are provided for each of the light beams divided out by the optical system.

2. Photographic camera as claimed in claim 1, characterised in that the prisms are cemented together to form a unit having two arms disposed at right angles to each other, one of said arms of the unit consisting of two prisms which are provided with the parallel partly reflecting boundary surfaces arranged one behind the other on the optical axis of the lens, while the other of said arms has the totally reflecting surface.

3. Photographic camera as claimed in claim 2, characterised in that the film is so arranged, for example by being positioned by means of guide rollers of known type provided in the camera, that it turns in zig-zag manner in three directions successively at right angles to one another, the individual portions of the film being so bent forming respectively surfaces for the exposure of the component negatives.

4. A modification of the photographic camera as claimed in any of claims 1 to 3, characterised in that the prismatic components having the reflecting surfaces are replaced by three mirrors two of which are partly reflecting and the third of which is totally reflecting, these three mirrors being arranged to form a system having optical properties corresponding to those of the three prisms.

5. Photographic camera arranged and operating substantially as herein described with reference to Figs. 1 and 2 of the accompanying drawing.

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