

CLAIMS

1. An image observation apparatus provided with a lighting optical system for irradiating an object to be observed with an illumination light and an observation optical system for collecting object light from the object to be observed and guiding it to a detector, wherein the apparatus comprises:
a filter member for dividing optical attribute of the illumination light into one or more solid angle regions,
an objective lens opposed to the object to be observed;
a beam splitter disposed on an opposite side to the object to be observed with respect to the objective lens and in which the illumination optical axis of the lighting optical system and the observation optical axis of the observation optical system are made coincide with each other; and
the filter member or a relay image of the filter member being disposed on the opposite side to the object to be observed with respect to the objective lens and near in front of the focusing position of the objective lens on the illumination optical axis.
2. The image observation apparatus according to claim 1, wherein said filter member or the relay image of the filter member is disposed at the position of an

aperture stop that determines a numerical aperture of said objective lens.

3. The image observation apparatus according to
5 claim 1 or 2, wherein in said filter member said optical attribute is a light wavelength region.
4. The image observation apparatus according to
10 any one of claims 1 to 3, wherein either of said lighting optical system and said observation optical system is a telecentric optical system on the side of the object to be observed.
5. The image observation apparatus according to any
15 one of claims 1 to 4, wherein said relay image is a reduced image of said filter member.
6. The image observation apparatus according to any
20 one of claims 1 to 5, wherein said objective lens is interchangeable.
7. A lighting optical system to be used in an image observation apparatus which collects an object light from an object to be observed and makes an image of
25 the object to be observed observable, wherein the lighting optical system comprises:
a filter member for dividing optical attribute of

the illumination light into one or more solid angle regions,

an objective lens opposed to the object to be observed;

5 a beam splitter disposed on an opposite side to the object to be observed with respect to the objective lens and in which the illumination optical axis of the lighting optical system and the observation optical axis of the observation optical
10 system are in agreement with each other; and
 the filter member that divides optical attributes of the illumination light into one or more solid angle regions, or a relay image of the filter member being disposed on the opposite side to the object to
15 be observed with respect to the objective lens and near the focusing position of the objective lens on the illumination optical axis.

8. The lighting optical system according to claim
20 7, wherein

 said filter member or the relay image of the filter member is disposed at a position of an aperture stop that determines a numerical aperture of said objective lens.

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9. The lighting optical system according to claim 7 or 8, wherein

in said filter member said optical attribute is
a light wavelength region.

10. The lighting optical system according to any one
5 of claims 7 to 9, wherein

either of said lighting optical system and said
observation optical system is a telecentric optical
system on the side of the object to be observed.

10 11. The lighting optical system according to any one
of claims 7 to 10, wherein

said relay image is a reduced image of said
filter member.