CLAIMS

1. A viewing system including a first display and a first optical assembly including a first optical relay and a partially transparent first optical combiner, said first optical relay comprising only dioptric optical components operating by transmission, the first optical relay including a first frontal lens, the first optical assembly being arranged to form a second image at infinity of a first image displayed by the first display, the viewing system being intended to be worn on the head of a user, the first optical combiner being placed in front of one of the two eyes of said user under the conditions of use, the exit optical pupil of the first assembly being placed level with said eye, the optical axis of the first optical assembly corresponding to the light ray of the central field of view passing through the center of the optical pupil, wherein:

the first optical combiner is a thin plate having substantially parallel curved faces, each face being defined by a polynomial relationship or a file of points defining a free-form;

the inclination of the first optical combiner to the optical axis is about 35 degrees;

the distance separating the exit pupil from the point of intersection between the optical axis and the first optical combiner is about 60 millimeters; and

in the position of use, the inclination of the mean optical axis of the first optical combiner and of the first frontal lens, in a vertical plane and with respect to a straight line joining the centers of the two eyes, is about 25 degrees, so that the first optical relay is located level with the forehead and

above the other eye of the user, in crossed position with the first optical combiner.

2. The viewing system as claimed in claim 1, wherein the first optical relay including a first frontal lens, the first surface of said first frontal lens located closest to the combiner is defined by a polynomial relationship or a file of points defining a free-form.

3. The viewing system as claimed in claim 2, wherein the second surface of the first frontal lens is aspherical or is defined by a polynomial relationship or a file of points defining a free-form.

4. The viewing system as claimed in claim 1, wherein the first display being an LCD or OLED display, the first optical relay only includes, in order from the first optical combiner to the first display: the first frontal lens, a doublet of convergent-divergent lenses with spherical surfaces, and an eccentric biconvex lens with spherical surfaces.

5. The viewing system as claimed in claim 1, wherein the first display being an LCOS display and the system including a light source, the first optical relay is telecentric and includes only, in order from the first optical combiner to the first display: the first frontal lens, a doublet of convergent-divergent lenses with spherical surfaces, an eccentric converging meniscus lens with spherical surfaces, a beam-splitter cube able to reflect the light emitted by the light source toward the first display, and an eccentric biconvex lens with spherical surfaces.

6. The viewing system as claimed in claim 5, wherein the beam-splitter cube is a PBS cube.

7. The viewing system as claimed in claim 1, wherein the system being binocular, it includes a second display and a second optical assembly including a second optical relay and a partially transparent second optical combiner, the second display being identical to the first display and the second optical assembly being identical to the first optical assembly, the second display and the second optical assembly being placed symmetrically with respect to the first display and to the first optical assembly, so that the second optical combiner is placed in front of the other eye of the user, the first optical relay being placed above the second optical combiner and the second optical relay being placed above the first optical combiner, the plane of symmetry being the median plane of the head.