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J. C. STIMSON

1,906,655

PROCESS AND APPARATUS FOR MAKING REFLECTING DEVICES

Original Filed Nov. 3, 1928

Fig. 1.

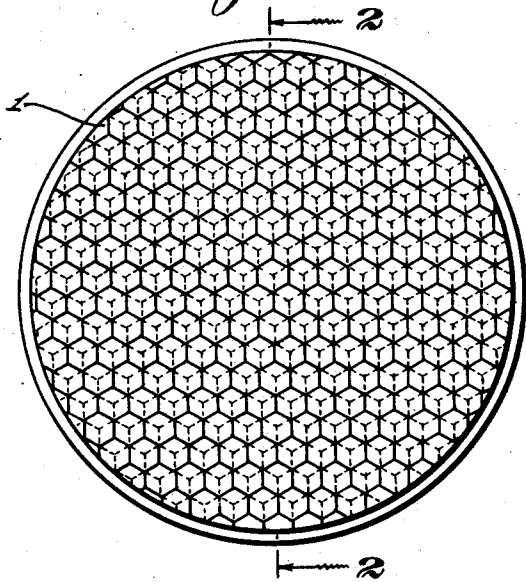


Fig. 2.

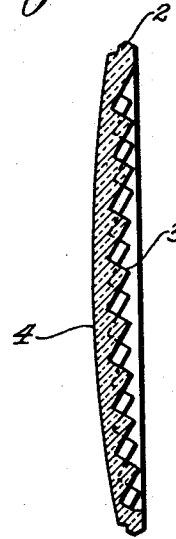
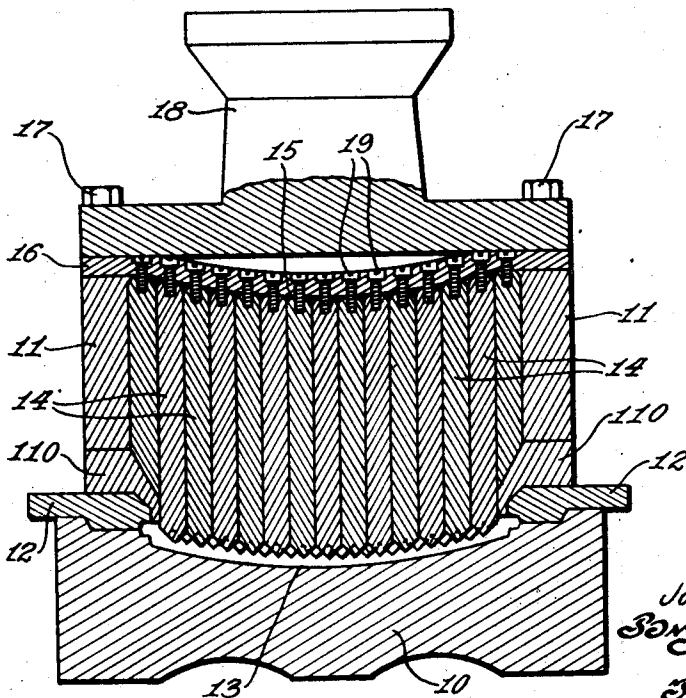


Fig. 3.



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PROCESS AND APPARATUS FOR MAKING REFLECTING DEVICES

Original application filed November 3, 1928, Serial No. 316,997. Divided and this application filed November 18, 1929. Serial No. 407,816.

This invention relates to means for making reflecting devices of the general character described in application Serial Number 316,997, filed November 3, 1928, now Patent No. 1,807,350, granted May 26, 1931, of which this application is a division.

One of the objects of this invention is to provide means for making a reflector having a series of reflecting units arranged in contiguous relation and whereby the front face is formed spheric or in such a manner as to substantially obviate uncolored reflection approximate the light source.

Another object is to provide a process and apparatus for making a reflector of the character described in a simple, effective and accurate manner.

Further objects will appear from the detail description taken in connection with the accompanying drawing, in which—

Figure 1 is a face view of a reflector adapted to be made in accordance with the process and apparatus embodying this invention;

Figure 2 is a section on the line 2—2, Figure 1; and

Figure 3 is a vertical section of an apparatus and illustrating the process embodying this invention.

A reflector adapted to be made in accordance with the process and with the apparatus embodying this invention is of the general character illustrated in Patent No. 1,671,086, May 22, 1928, while a process and apparatus for making such a reflector is disclosed in Patent No. 1,591,572, July 6, 1926. The reflector, however, has a suitably formed front face in order to obviate uncolored reflection approximate the light source, and this can be accomplished by giving the reflector front a spheric form. In order, however, to secure, for instance, a prismatic plate of uniform thickness or depth, the process is so carried out and the apparatus so constructed that the reflecting aperture is arranged to conform to the front face, while the axes of the reflecting units are parallel.

The reflector may be formed basically and generally in accordance with the process and by the mould described in Patent No. 1,591,

572. One of the mould members is, however, provided with a spheric front-forming surface while the other mould member has the elements thereof assembled and arranged to conform the reflector forming matrix thereof generally to that spheric surface. This is accomplished by locating the elements by a spheric surface while the axes of these elements remain parallel.

Referring now to the accompanying drawing, 1 designates a plate, which is in this particular embodiment of circular contour, although it will be understood that the reflector may be of any other suitable formation. It may be provided with a rim 2 so as to fit a suitable holder. The reflector is, in this particular embodiment, in the form of a prismatic plate formed of pressed glass. It has on the back thereof a series of reflecting units 3, which in this particular embodiment are shown as triple reflectors of the character described in Patent No. 1,591,572 and Patent No. 1,671,086. The front face 4 of the reflector is spheric, the radius of curvature of which may be varied to suit requirements, the particular radius shown being suitable to obtain the desired results, although it will be understood that various other formations may be employed. The units, as assembled to form the reflecting apertures, conform generally to and follow the spheric front face of the reflector and the axes of these units are parallel.

Where the reflecting units are triple reflectors arranged in contiguous relation to form the reflector apertures, each of these units has reflecting surfaces arranged relatively at approximate right angles and in a circuit around the axes thereof, so that light impinging thereon from a distant source will be reflected about said axes and back approximate the light source. As described in said patents, however, one or more of the reflecting surfaces may deviate as a whole slightly from optically true right angular relation, in order to cause a definite spread of the reflected light while by the formation of the surfaces or the medium employed, the reflected light is distributed throughout the field of spread in order to

direct a definite spreading beam of substantially uniform intensity back towards and visible to an observer located a substantial distance outside the line connecting the reflector with the light source.

The action of the reflector with its front face formed as shown and described is to obviate uncolored reflection approximate the light source. This is fully described in the parent application Serial Number 316,997, to which reference is had.

Referring now to Figure 3, which corresponds in general to Figure 1 of Patent No. 1,591,572, 10 and 11 designate the mould members, 10 being the mould proper while 11 is the plunger; the usual ring is shown at 12. The bottom of the mould cavity is made spheric as shown at 13, to form the desired front face of the reflector. The plunger 10 carries a series of mould elements 14, which are formed as described in Patent No. 1,591,572, to provide, when assembled, a matrix for forming the reflecting surfaces. The reflector-forming faces of the mould elements are provided at the ends thereof; the other ends of these elements, however, bear against a spheric surface 15 conforming to the surface 13 in the mould cavity. The surface 15 may be on a part 16 attached to the plunger, as by screws 17, attaching 11 and 16 to the head 18. The ends of the mould elements engaging the surface 15 are preferably rounded, as shown, and these elements are secured in the part 16 by screws 19. A part 110 secured to 11 is formed to enter the ring 12.

With the mould as shown, the mould elements are secured in position with their axes parallel, but with the matrix conforming generally to the surface 13, forming, as it does, the front face of the reflector. The pressing operation may now be proceeded with in the manner described in Patent No. 1,591,572, and it will be seen that by the apparatus, the reflector shown in Figures 1 and 2 will be accurately formed to shape, in order to produce a spheric front face and a series of reflecting units on the back, conforming generally to this front face.

While the invention is particularly applicable to the general type of reflector specifically shown and described, it will be understood that the invention is applicable in many cases to other forms and types of reflectors. Thus, while a triply reflecting unit is particularly useful and particularly permits attainment of the objects of this invention, when employed as described, other reflecting units adapted to direct light impinging thereon at varying angles back approximate the light source may be employed. Moreover, while the invention is particularly applicable to glass reflectors, it will be understood that the term "glass" is used descriptively and not limitatively. Further-

more, in many of its phases, the invention is applicable to other than prismatic reflectors, as many features of this invention are applicable to reflectors of the hollow or metallic type; in which case, of course, the front of the reflector will provide a cover glass, which is in such case formed to obviate uncolored reflection in the manner described. While the front face of the reflector is preferably spheric, in order to attain the most desirable results, it will be understood that it may be spheric functionally only; it is, therefore, to be understood that the terms "spheric" and "spherical" are used descriptively and not limitatively. It will, furthermore, be understood that certain features, operations and sub-combinations are of utility and may be employed without reference to other features, operations and sub-combinations; that is contemplated by and is within the scope of the appended claims. It is, furthermore, obvious that various changes may be made in details and operations, within the scope of the appended claims, without departing from the spirit of this invention. It is, therefore, to be understood that this invention is not to be limited to the specific details and operations shown and/or described.

Having thus described the invention, what is claimed is:

1. In the art of making reflectors of the character described and having a series of reflecting units arranged in contiguous relation, the process comprising, assembling a series of forming elements to provide a matrix of the reflecting surfaces and positioning the elements to conform the matrix generally to a spherical surface, and conforming the units to the matrix.

2. In the art of making reflectors of the character described and having a series of reflecting units arranged in contiguous relation, the process comprising, assembling a series of forming elements with their ends providing a matrix of the reflecting surfaces and positioning the elements by a spheric surface, and conforming the units to the matrix.

3. In the art of making reflectors of the character described and having a series of reflecting units arranged in contiguous relation, the process comprising, providing a spheric front-forming surface, and assembling and positioning a series of forming elements to conform the reflector-forming matrix thereof generally to that spheric surface, and conforming the units to the matrix.

4. A mould of the character described, comprising, a series of mould elements arranged in assembled relation to provide a matrix and means for positioning said elements to conform the matrix generally to a spheric surface.

5. A mould of the character described,

comprising, a series of mould elements arranged in assembled relation with their ends forming a matrix and a spheric surface engaging and positioning said elements.

5 6. A mould of the character described, comprising, a mould member having a spheric forming face, and a cooperating mould member having a series of mould elements arranged in assembled relation to provide a matrix conforming generally to the
10 forming face on the first mould member.

7. A mould of the character described, comprising, a series of mould elements arranged in assembled relation to provide a
15 matrix, and positioning means for unequally displacing said elements from a reference plane perpendicular to the axes thereof.

In testimony whereof I have affixed my signature this 9th day of November 1929.

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