Sept. 12, 1933. H. D. NORTH 1,926,732

DIFFUSELY REFLECTING SURFACES AND PROCESS OF MAKING SAME

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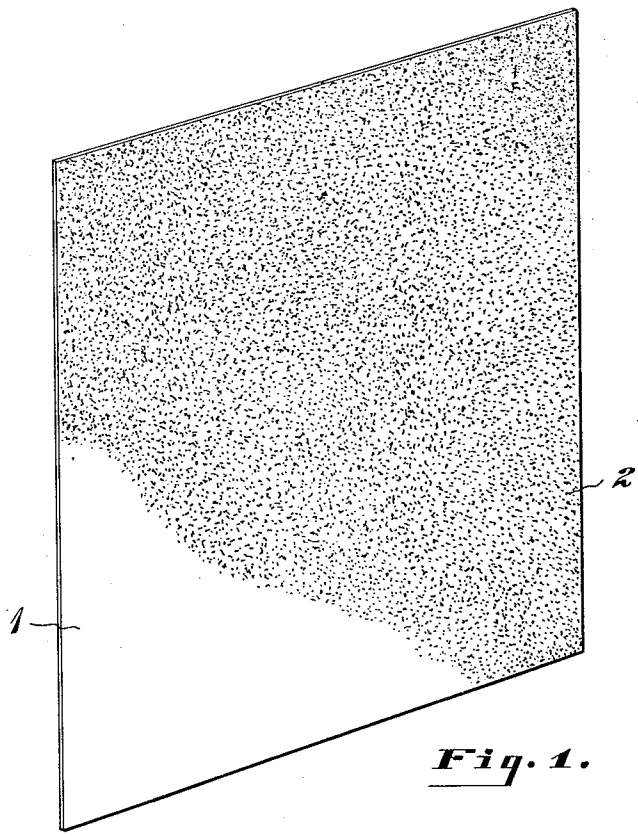


Fig. 1.

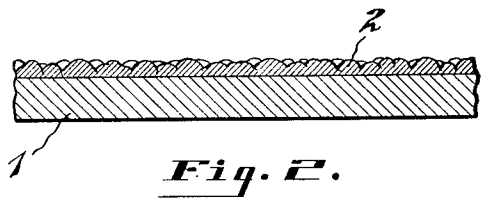


Fig. 2.

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DIFFUSELY REFLECTING SURFACES AND PROCESS OF MAKING SAME

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7 Claims. (Cl. 88—24)

This invention relates to diffusely reflecting surfaces and a process for making the same, and particularly to such surfaces primarily designed for displaying projected pictures.

In my Patent No. 1,720,232 which issued July 9, 1929 on my application, Serial No. 262,940, filed March 19, 1928, I have disclosed the general theory of diffusely reflecting surfaces, in which the reflecting surface consists of microscopic elements of convexly curved contour having a metallic lustre. It has been shown in that application that such surfaces, from an optical viewpoint, function more efficiently than any of the other forms of reflecting surfaces which have been heretofore used.

In the application just mentioned, I have disclosed a method of manufacturing such surfaces by spraying a support with minute drops of molten metal, and the present application is a continuation in part of said application.

One of the objects of this invention is to provide diffusely reflecting surfaces and the like which are superior in quality and more durable than previously known surfaces.

Another object is to provide a process for making diffusely reflecting surfaces wherein such surfaces can be easily and economically produced with considerable speed and efficiency.

A further object is to provide a process of making diffusely reflecting surfaces having a metallic lustre which is particularly adapted to make use of metals in their molten condition.

A still further object is to provide a process of making diffusely reflecting surfaces, wherein a support is sprayed with minute molten globules of a metallic substance.

With these and other objects in view, the present invention may be said to comprise the diffusely reflecting surface and its particular method of manufacture, illustrated in the accompanying drawing to be hereinafter described, and particularly set forth in the appended claims, together with such variations and modifications thereof as will be apparent to one skilled in the art to which this invention appertains.

In the accompanying drawing,

Figure 1 is a perspective view of a partially constructed screen formed by the process of the present invention.

Fig. 2 is a greatly enlarged sectional view of the screen shown in Fig. 1 showing the surface structure produced by the process of the present invention.

The reflecting surface may be applied to a suitable rigid support 1, such as, for example, a sheet of aluminum, although other supports, not necessarily of metal, may be used.

This invention, as previously mentioned, generally consists in providing the support with minute globules 2 of molten metal fused thereto, so that the finished surface will have a metallic lustre and will consist of minute surface elements varying in size and being of convexly curved contour.

It has been found that one satisfactory method of applying the minute molten globules 2 of metal to the support 1 is to employ a suitable spray gun, which allows the metallic surface to be applied with great efficiency and rapidity.

The support 1, which is to have the diffusely reflecting surface 2 applied thereto, preferably has a smooth surface that is first cleaned of all impurities which might affect the surface coating as it is applied. The metal with which the support is to be coated may be aluminum, silver, chromium (either pure or as an alloy), tin or any other desirable specular metal or alloy 3. The metal is melted within the spray gun and the molten metal is disassociated by air or gas pressure into a fine mist of metallic globules of minute size. The fine mist of metallic globules is directed toward the support and as they strike the surface of the support 1 adhere thereto and solidify upon cooling, thereby forming a continuous mass having the desired surface structure. In other words, a continuous deposit is fused on the surface of the support, the surface of which instead of being smooth, is composed of an innumerable number of closely associated protuberances of varying minute size, more or less convexly curved in their outward contour, and having a metallic lustre. It is, of course, understood that the molten metallic globules should not be fed to the support with such force that they break up and coalesce or run into each other and form a smooth surface, which would cause specular reflection. As shown in Fig. 2, the minute globules 2 may coalesce a slight amount adjacent the support 1 but retain their convexly curved contour on their outer exposed aspect.

The molten metal may be applied to the support in a single coat or in a plurality of coats, but regardless of whether one or more coats is applied, these globules, in general, become very closely associated into a continuous agglomerated mass of metal having a surface composed of elements of convexly curved contour.

It is apparent that with the process of the present invention it is possible to obtain a very

highly reflecting surface which has superior qualities, as regards its ability to reflect light in all directions, its power to reflect such light truly from the point at which it strikes the surface, and its power to reflect such light truly both as regards color and intensity, all because of the closely associated metallic surface elements of convexly curved contour and metallic lustre, thus making a very superior surface on which to project a picture.

It will thus be seen that a coating formed by my process will consist of a body of minute globules of metal fused together or firmly adhering to each other, and providing a mass of metal having a surface composed of elements of convexly curved contour on their outer aspects and having a bright metallic lustre. This surface has greater durability than surfaces of this sort previously known, and it may be cleaned by polishing or by the use of suitable detergents without substantially impairing the reflecting qualities of the surface.

Furthermore, it is to be understood that the particular forms of apparatus shown and described, and the particular procedure set forth, are presented for purposes of explanation and illustration and that various modifications of said apparatus and procedure can be made without departing from my invention as defined in the appended claims.

What I claim is:

1. The process of forming a light reflecting surface, which consists in spraying minute drops of molten metal on a support at low velocity, and causing them to solidify and form a continuous mass with an outer surface consisting of minute elements of convex contour having metallic reflecting surfaces.

2. The process of forming a light reflecting surface, which comprises depositing at low velocity a fine mist of molten globules of metal on a support in closely associated relationship, causing said globules to adhere to said support to produce a substantially continuous mass of minute convexly curved globules having metallic lustre on their outer surfaces.

3. The process of forming a diffusely reflecting surface for displaying projected pictures, which comprises melting a suitable metal, disassociating the molten metal into a fine mist of minute globules, and applying said molten mist to said support at low velocity but with sufficient pressure to cause said globules to adhere thereto and causing them to solidify in closely associated, adherent relationship to form a surface consisting of elements of convex contour and bright metallic reflecting surfaces.

4. A diffusely reflecting surface for displaying projected pictures, comprising a support and a metallic coating rigidly fused to said support, said coating consisting of a substantially continuous mass of solidified metal having a bright metallic lustre, the reflecting surface thereof being composed of closely associated minute metallic surface elements of convexly curved contour on their outer aspects.

5. A reflecting surface for displaying projected pictures, comprising a support and a metallic coating rigidly adhering to said support, said coating consisting of a continuous mass of solidified metal having a bright metallic lustre, the reflecting surface thereof being composed of minute metallic globules of convexly curved contour on their outer exposed aspects.

6. The process of forming a diffusely reflecting surface for light, which comprises melting metal, atomizing the molten metal to form droplets of minute size, applying such droplets to a supporting surface at low velocity and in several operations to largely prevent coalescence of the droplets lying adjacent to one another, whereby the spheroidal form on the outer aspect of the individual particles may be substantially preserved.

7. A screen for displaying projected pictures, comprising a support having a coating thereon forming a reflecting surface, said coating consisting of an integral mass of metal united to said support, the reflecting surface of said metal coating being composed of protruding convex reflecting elements of microscopic size and substantially spheroidal contour.

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