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MIRROR PROTECTIVE COATING

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This invention relates to an improved mirror protective coating or material for application to mirror backs.

The reflecting layer normally provided on mirrors is extremely thin and is easily damaged. It is likewise susceptible to peeling from its glass or other transparent support, particularly under adverse environmental conditions. Accordingly, to protect the reflecting layer, and thereby to prolong mirror life, it is customary to provide the back surfaces of the mirror with a protective coating, as of a varnish or paint.

The great majority of protective coatings for mirrors now known in the art give satisfactory results under normal conditions. A special problem has arisen, however, in connection with the maintenance of mirrors used aboard ship, and particularly those used in fire and engine rooms where the atmosphere is moist and hot. When placed in such locations, mirrors provided with any one or more of the protective coatings heretofore known in the art last but a short time, the reflecting layer often peeling away from its base in a matter of a few weeks time.

The best protective coating known to have been developed to date for usage under these conditions is a paint having iron oxide as a major ingredient. However, even those mirrors which have been coated with the iron oxide paint do not last as long as it is desired they should.

It is therefore an object of this invention to provide an improved protective coating for use on mirror backs.

A more particular object is to provide such a coating which adequately protects the reflecting material layer of mirrors which are used under adverse environmental conditions, as in a hot, moist atmosphere.

Other objects of this invention will become apparent from the following description and appended claims.

I have found that the life of mirrors used aboard ship in fire and engine rooms can be greatly extended by providing the back thereof, that is, the rearward, or open, side of the reflecting layer, with a coating having chlorinated rubber as its principal ingredient. This coating is applied in the form of a liquid which contains from about 10 to about 30 per cent chlorinated rubber, either natural rubber, as guayule or the East India type, or a synthetic rubber product, as neoprene or Buna-S, being satisfactory; from about 1 to about 10 per cent of a suitable plasticizing ingredient, as tricresyl phosphate or one of the chlorinated diphenyls; and from about 5

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to about 25 per cent of bone black or an equivalent carbonaceous material. The balance of the solution normally consists of a solvent for the chlorinated rubber ingredient, as xylol, carbon tetrachloride, butyl acetate, benzol, or the like.

A preferred solution is one containing about 15 to 20 per cent of the rubber ingredient, about 2 to 5 per cent of the plasticizer, and about 13 to 20 per cent bone black, with solvent making up the remainder. These ingredients may be added in any desired order, but the resulting mixture should be stirred until a smooth solution is obtained.

The above described solution is applied by brush, or otherwise, to the back of the mirror. It may be placed directly in contact with the reflecting layer, or an intervening layer of some other protective material may be used, the rubber solution disclosed herein being applied, in turn, over any such intervening protective layer or layers.

Once the solution is in place, the solvent portion thereof is caused to be evaporated, thereby leaving the back of the mirror provided with a tough, resilient, and highly adherent coating which serves to protect the underlying reflecting material layer under even the most extreme environmental conditions. When desired, this evaporation process can be speeded up by placing the coated mirror in an oven maintained at a somewhat elevated temperature.

While the protective coating here disclosed is resilient, and thereby aids in protecting the mirror from damage by shock, it is also sufficiently brittle that it breaks cleanly along the mirror's cleavage lines when the mirror is cut. This quality permits the protective coating here disclosed to be applied to large mirror back areas when the mirror is in the shop and can be treated under ideal conditions. The coated mirror can then be shaped as desired by cutting without destroying its protective coating.

I have found that the above described combination of qualities can best be achieved by utilizing the solution whose composition has been disclosed above.

Example

To illustrate the manner in which this invention finds application, the following example is given. A coating solution was prepared which consisted of 18 per cent chlorinated guayule; 2 per cent tricresyl phosphate; 16 per cent bone black; and 64 per cent xylol. This solution was viscous, but was easily spread over the back surface of a

relatively large mirror. In this case, the protective coating was applied directly over the silver reflecting layer, and no intervening protective materials were utilized. The applied rubber material was allowed to dry at room temperatures, and upon drying, it set to form a tough, resilient coating which was firmly joined to the underlying reflecting material layer. The coated mirror was then cut into several smaller mirrors by using a stylus to scratch the glass and then breaking the glass along the scratch lines by pressure. The rubber back on the mirror was found to have broken cleanly along the line of each cut, or break, in the glass, and in no place did the protective coating pull away from the back of the mirror. The smaller mirrors so obtained were then placed for test in the engine room of a ship. Periodic examination thereafter showed that the life of the mirrors coated in this fashion was at least twice that of mirrors which were protected in the best fashion heretofore known to the art.

The various percentages employed herein, and in the appended claims, refer to percentage by weight of the entire solution or mixture under discussion.

While this invention is described in terms of particular ingredients, and ranges thereof, to be used, it is obvious that many modifications and variations in the nature and proportions of the ingredients may be made without departing from the spirit and scope of the invention, and only such limitations should be imposed as are indicated in the appended claims.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

I claim:

1. A composition for application to mirror backs to provide an improved protective coating thereon, consisting substantially of from about 15 to about 20 per cent chlorinated rubber, from about 2 to about 5 per cent of a plasticizing ingredient for said clorinated rubber, and from about 13 to about 20 per cent bone black, the balance of the composition comprising a solvent for said chlorinated rubber.

2. A composition for application to mirror backs to provide an improved protective coating thereon, consisting substantially of about 18 per cent chlorinated Guayule, about 2 per cent tricresyl phosphate, about 16 per cent bone black, and about 64 per cent xylol.

3. As a new article of manufacture, a mirror having firmly joined to the rear portion thereof a protective coating formed by applying thereto a liquid composition comprising from about 15 to 20 per cent chlorinated rubber, from about 2 to about 5 per cent of a plasticizing ingredient for said chlorinated rubber, and from about 13 to about 20 per cent bone black, the balance of the composition comprising a solvent for said chlorinated rubber, said composition being dried on said rear mirror portion to form said coating.

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