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HALOGEN CONTAINING RESIN STABILIZED WITH AN ACETYLENE ALCOHOL

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The present invention relates to improved plastic masses.

In the processing of plastic masses, which generally is carried out in the heat, corrosion often occurs in the metallic, especially in the iron, parts of the apparatus employed, for instance of the rollers and molds used. These corrosion phenomena are obviously due to slight decompositions taking place when working certain plastics or when coemploying certain addition or assistant products, whereby corrosive substances, especially those of an acid nature, such as hydrogen chloride, acetic acid or other acids are formed. Such plastics are, for example, high-polymer substances containing halogen atoms, such as polymerisation or interpolymerisation products of vinyl chloride, vinylidene chloride, vinyl and acrylic acid esters and cellulose esters. To meet this inconvenience, additions to the plastic masses of so-called stabilizers have been suggested, e. g. substances which are to repress or inhibit the decomposition. While these substances exert a remarkable stabilizing action in many cases, they are not able to prevent satisfactorily the corrosion of metals coming in contact with plastic masses at elevated temperatures.

The object of our present invention is to provide a composition of matter which is free from these difficulties and can be processed without causing corrosions on metal, in particular iron, parts of the apparatus employed therefor.

We have found that the corrosion effect of plastic masses on metals, in particular on iron, can be overcome by the addition of even a small percentage of a hydroxy compound having a triple bond between two carbon atoms, e. g. of an acetylene alcohol or of an oxalkylation product thereof, for example of propargylic alcohol, 1.4-butinediol and the like or their hydroxyalkyl ethers, e. g. hydroxyethyl ethers or polyhydroxyethylation products. The presence in plastic masses of these triply unsaturated hydroxy compounds not only has the effect of preventing corrosion of the metal, especially the iron, parts of the apparatus, e. g. iron molds or rollers, used in the processing of the said plastic masses, but to re-establish also the initial polish of such metal parts, when these had been slightly corroded by previous contacts with corrosive plastic masses.

In some cases also the addition of the said unsaturated hydroxy compounds may allow of using such substances as were heretofore inapplicable for their highly corrosive properties.

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Thus, for example, it is the common practice in the making of porous plastic masses to add so-called expanding agents, i. e. substances which undergo decomposition in the heat thus forming gases and which expand the material by the action of the gases liberated. Widely known as a substance of this type and which, by adding cheapness to the capacity of forming an abundant amount of gas on decomposition, would make a suitable expanding agent for plastics, is ammonium nitrite. Being highly unstable, it may be used in the form of an equimolecular mixture of sodium nitrite and an ammonium salt, for instance ammonium chloride, ammonium sulfate or ammonium carbonate. Ammonium nitrite, however, while acting satisfactorily as an expanding agent, cannot be used in many cases, as it is liable to cause strong corrosions in the molds. No corrosion, however, occurs when plastic materials in which ammonium nitrite has been incorporated as an expanding agent, are admixed with a slight percentage of a hydroxy compound having a triple bond between two carbon atoms. Ammonium nitrite is, therefore, no longer objectionable as an expanding agent for plastics.

In practical use, the said unsaturated hydroxy compounds are applied, preferably, in amounts ranging from 0.05 to 3 per cent, preferably from 0.25 to 3 per cent (percentage with reference to the weight of the plastic material), but larger percentages may also be employed.

The following examples serve to illustrate the nature of this invention, but the invention is not intended to be restricted to these examples. The parts are by weight.

Example 1

1000 parts of a polymer of vinylidene chloride or of a copolymer of vinylidene chloride and vinylchloride, in which plasticizers may be incorporated, are laminated on iron rollers, at elevated temperatures, after the addition of 1 part of 1.4-butinediol, and the laminates obtained are pressed to form foils or plates. Even after prolonged use the rollers and molds show no marks of corrosion, whereas in the absence of butinediol the iron parts of the apparatus used would be attacked within a short time. Owing to the corrosion which ordinarily iron is liable to suffer by contact especially with vinylidene, it was hitherto inapplicable in the construction of rollers and molds in which such polymers were processed, and special non-corrosive steels had instead to be used.

Example 2

1000 parts of plasticized cellulose acetate are homogeneously mixed with 2 parts of propargylic alcohol and made up in known manner to form an injection-molding material. While no corrosion is caused by this mixture when injected into the molds, some slight corrosion will occur upon the polished iron parts of the molds through the contact for some length of time with the same type of plasticized cellulose acetate when no propargylic alcohol has been added.

Instead of propargylic alcohol the oxyethyl ether thereof may be employed with the same success.

Example 3

50 parts of polyvinyl chloride, 50 parts of dibutylphthalate, 6.9 parts of sodium nitrite, 5.3 parts of ammonium chloride and 0.4 part of butinediol are homogeneously intermixed and heat-pressed in a mold of ordinary steel, porous shapes being obtained. Even after several weeks' service the steel-mold does not appear to be stained by corrosion, whereas the polish of the mold gets seriously marred already when twice contacted with the same mass to which, however, no butinediol had been added.

What we claim is:

1. A composition of matter comprising a high-polymer substance containing halogen atoms, and a small amount of a hydroxy compound having a triple linkage between two carbon atoms.

2. A composition of matter comprising a high-polymer substance consisting at least in part of polymerized vinyl chloride and a small amount of an acetylene alcohol.

3. A composition of matter comprising a high-polymer substance consisting at least in part of polymerized vinyl chloride and a small amount of 1.4-butinediol.

4. A composition of matter comprising a high-polymer substance consisting at least in part of polymerized vinyl chloride and a small amount of propargylic alcohol.

5. A composition of matter comprising a high-polymer substance consisting at least in part of polymerized vinylidene chloride and a small amount of an acetylene alcohol.

6. A composition of matter comprising a high-polymer substance consisting at least in part of polymerized vinylidene chloride and a small amount of 1.4-butinediol.

7. A composition of matter comprising a high-polymer substance consisting at least in part of polymerized vinylidene chloride and a small amount of propargylic alcohol.

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REFERENCES CITED

The following references are of record in the file of this patent:

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