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METAL DIGESTER HAVING A CORROSION RESISTANT METAL LINING

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Our present invention relates to linings for digesters used in the pulp industry particularly those employed in the so-called monosulfite process. In this process the wood or other cellulosic material is cooked with a liquor consisting of a solution of sodium or calcium sulfite. This liquor while neutral or even on the slightly alkaline side at the start of the cook nevertheless has proved corrosive to the metal containers due presumably to the fact that wood contains acid forming substances which are liberated during the cook.

We have now discovered that sprayed coatings of certain metals resist the effect of the liquor and satisfactorily protect the metal of the digester from corrosion. In view of the somewhat porous nature of such coating as well as the stresses set up incident to expansion and contraction due to temperature changes, this result was not to have been expected. Of the various metals we have found cadmium, Monel, stainless steel, tin, lead and various bronzes to give a coating of the desired properties. Of these metals we prefer cadmium which in addition to its own properties as a protecting agent forms a layer of yellow cadmium sulfide with the cooking liquor which further acts as a protective coating.

One great advantage of the improved metal coating is that it can be applied in situ by the use of known means as for example a so-called pistol which operates by feeding a wire of the metal to be sprayed into a flame produced by concurrent streams of a combustible gas and oxygen, the liquefied metal being atomized by a stream of air or non-oxidizing gas. Before the coating is sprayed, the interior steel surface of the digester is suitably roughened preferably by scrubbing with steel grit or by sand blasting, whereupon the metal is sprayed in known manner. After the coating has been applied, the same is preferably gone over with a wire brush which tends to close up any porous spots on the surface and renders the same bright and smooth. The thickness of the coating may vary from .005 to .040 inch. If desired, a second coating of the same or a different metal may be sprayed over the first one.

While of particular utility for monosulfite digesters, the improved coating especially of cadmium, is also useful for ordinary acid sulfite cooks, i. e. using sodium or calcium or other sulfite salt with an excess of sulphurous acid. Accordingly, in the claims by sulfite pulp digester we intend to include those used both for monosulfite liquors and acid sulfite liquors.

We claim:

1. A sulfite pulp digester composed of a steel shell and having a firmly adherent, impervious, sprayed lining of a corrosion resisting metal.

2. A sulfite pulp digester composed of a steel shell and having a firmly adherent, impervious, sprayed lining of a metal composed of at least one of the following corrosion resisting metals: cadmium, Monel, stainless steel, tin, lead and bronze.

3. A sulfite pulp digester composed of a steel shell having a protective interior coating of sprayed cadmium.

4. A monosulfite pulp digester composed of a steel shell and having a firmly adherent, impervious, sprayed lining of a metal composed of at least one of the following corrosion resisting metals: cadmium, Monel, stainless steel, tin, lead and bronze.

5. A sulfite pulp digester composed of a steel shell and having a firmly adherent, impervious, sprayed lining of a corrosion resisting metal, said digester being capable of resisting the corrosive effects of the acid cooking liquors.

6. A sulfite pulp digester composed of a steel shell having a protective interior coating of sprayed cadmium of from .005 to .040 inch thickness.

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