

ALIEN PROPERTY CUSTODIAN

METHOD OF SEPARATING SLIMES CONTAINING FIBROUS MATERIALS

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The present invention relates to the separation of fibrous materials from slimes or waste liquors containing the same. More particularly the invention relates to the separation of cellulosic fibrous materials from slimes or waste liquors obtained in the preparation of paper, pasteboard and the like.

Waste liquors of the type mentioned above which contain fibrous materials must be freed of such materials in order to avoid losses of valuable fibers and also to prevent undue contamination of water supply systems into which such waste liquors may be discharged. Separation of, for example, cellulosic fibrous materials from waste liquors has been tried by flotation methods involving the use of thickeners, collectors or filters. In such methods wetting agents, such as Turkey red oil, and flocculating agents, such as alum, have been used for the purpose of improving flotation of the fibrous materials. However, the use of such agents results in only a slow and incomplete flotation of the flocculated fibers, especially when the fibers to be separated include fibrous materials derived from processes for the recovery of old paper and such prior methods are not improved by the use of special oils and similar products which have been proposed heretofore.

It is an object of the present invention to provide an improved method of separating fibrous materials from slimes, waste liquors and the like containing the same, whereby flotation of the fibrous materials is effected rapidly and completely. Other objects of the invention will be apparent from the ensuing description thereof.

The above objects may be accomplished in accordance with the present invention by treating the slime or waste liquor containing fibrous materials with a flocculating agent, i. e. an agent such as alum which is capable of effecting the flocculation of the fibers, while having present in the liquor an oxygen-evolving compound. It has been discovered that the presence of an oxygen-evolving compound together with the flocculating agent and, if desired, a wetting agent effects a rapid and complete flotation of the fibrous material. Hydrogen peroxide is a very effective oxygen-evolving agent for the present purpose; however, other oxygen-evolving agents such as ozone, sodium peroxide, sodium perborate, persulfuric acid and salts thereof, etc., may be used with good results. When an oxygen-evolving compound such as those enumerated is used in conjunction with the known flocculating agents, it has been discovered that even the more

inert or "dead" fibrous materials may be floated rapidly so as to permit a quantitative recovery of the fibrous material. This is especially true if the treatment of such inert fibers involves also the use of wetting agents such as Turkey red oil. Various of the known flocculating agents may be used in accordance with the present method. However, the use of alum has been found to be especially well suited for use in conjunction with an oxygen-evolving compound, e. g. hydrogen peroxide. It may be noted that in some instances the effectiveness of the present process may be increased if there be present in the waste liquor during the treatment an agent which facilitates froth formation.

While the present method may be practiced for effecting the separation of fibrous materials from waste liquors of all types, especially satisfactory results are obtained if the liquor is neutral or alkaline during the treatment. Accordingly, in the preferred modification of the invention the method is applied to liquors which have been rendered alkaline in reaction, i. e. liquors having an alkalinity corresponding to a pH value above 7. It has been discovered that when using an alkaline medium small, thick flakes of separated fibrous materials are obtained and the type of flakes may be governed to a considerable extent by regulating the alkalinity in accordance with the type of flakes desired.

Optimum separation and flotation of the fibrous material results when the waste liquor, to which has been added the treating agents specified above, is subjected to reduced pressures. A practical manner for carrying out the present method involves first adjusting the pH of the liquor to be treated to a value corresponding to 7 or higher by the addition of a suitable alkaline material, such as sodium hydroxide, followed by the addition of a flocculating agent such as alum and then a wetting agent such as Turkey red oil. Hydrogen peroxide or some other suitable oxygen-evolving compound is finally added and the liquor subjected to reduced pressures. When operating in this manner there is obtained upon the upper surface of the liquor being treated thickened flakes of separated fibrous material which may be removed by known methods. It should be mentioned that the amount of wetting agents such as Turkey red oil employed should be adjusted so that the gas bubbles formed do not destroy the flakes of fibrous material formed. Depending upon whether the liquor being treated contains unusually large amounts of substances which accelerate the rate of evolution of oxygen from the oxygen-

evolving compound, it may or may not be advisable to have present in the liquor a stabilizer for the oxygen-evolving compound. Any of the well-known stabilizers for such compounds may be employed if circumstances warrant the use of such a stabilizer.

The present process is especially well suited for use in the flotation of paper which has been covered with thin metal foil. By means of the pres-

ent process, involving the use of hydrogen peroxide or a similar oxygen-evolving compound, the paper or fibrous portion of such metal foil-coated product is quickly separated by flotation whereas the metal is precipitated. This facilitates the economical separation of the paper or fibrous material from the metal foil.

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