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METHOD FOR DEINKING PRINTED PAPER.

No Drawing.

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This invention relates to improvements in the removal of printer's ink from papers and with this object in view such papers in accordance with this invention are pulped or shredded in the presence of aqueous solutions containing one or more alkalis or alkaline reacting substances, then agitated in the presence of artificially colloidized or partially colloidized mineral substances and finally washed and further treated in well known manner.

For the purposes of this invention the mineral substances are those having detergent properties such as the silicates of magnesium for example, soapstone, talc etc; clays such as china clay or kaolin; fuller's earth, kieselguhr etc., or silica powder or the like.

Such mineral substances are brought into a colloidized or partially colloidized state by known grinding or agitating means for instance, as intimately as possible in the presence of a relatively small quantity of a solution of what may be called a dispersator or deflocculant but which perhaps in this case is better termed a protective colloid having adhesive properties, such as casein, gelatine in its various forms, glues albumens, gums such as gum arabic or gum tragacanth, starch, dextrin or the like, alone or admixed. The effect of such small quantities of protective colloids is difficult to explain but their presence certainly leads not only to a better colloidization of the mineral substances but also to enhanced and more rapid de-inking or decolouring results when such mineral substances are brought into intimate contact with the paper than has hitherto been the case.

The following example serves to illustrate the materials and quantities thereof that have been used successfully for carrying the invention into effect. The heating apparatus employed was of ordinary known type.

About 450 grammes of ground soapstone are added to and mixed with about 4.300 grammes of water. After adding a semi-solution of 9 grammes of casein in alkaline water, the whole mixture is intimately ground for about 10 minutes, the time depending upon the construction of the grinder or disintegrator. To about 24 to 26 kilogrammes of printed paper which is being pulped in a beater containing about 475 to 480 kilogrammes of water and approxi-

mately 120 grammes of caustic soda or its equivalent in washing soda or similar alkali, the above described mixture is added and the agitation is continued for about 20 or 30 minutes until the printer's ink has been removed from the finely pulped paper.

The liquor containing the ink in suspension is then removed from the pulp by washing in drum washers or other washing machines as known in the art.

After the aforesaid treatment any remaining traces of alkali may if necessary be removed or neutralized with acids or acid salts in the way known in the paper trade and the pulp is, after bleaching or colouring, or both, in known manner, made into paper which is again quite suitable for printing or other purposes.

While the invention is primarily intended to be used for printed white paper the process has also been successfully employed with several kinds of coloured papers.

Experiments have shown that equally good de-inking results can be obtained with fuller's earth and gelatine, and that satisfactory results are given with kieselguhr and glue; china clay and dextrin or albumen; silica powder and starch solution; asbestos powder and gum arabic; etc., all of said substances being used in substantially the same proportions as those given above for soapstone and casein.

I am aware that the use of alkalis or alkaline substances for loosening the ink from the paper is known and also that a treatment for the de-inking of paper with peroxides of alkalis or alkaline earth metals and colloidal compounds such as colloidal silicic acid has already been proposed. Furthermore that the use of natural clays having the physical and chemical properties of "Bentonite" in combination with alkalis or alkaline reacting substances has been suggested for the same purpose, and I make no claim to the use of such natural clays per se but:—

What I claim is:—

1. A process for de-inking printed paper comprising the steps of pulping the paper in the presence of a solution of alkaline character; then subjecting the pulp, under agitation, to treatment with an aqueous composition, made by causing a mineral substance having detergent properties to become as finely sub-divided as possible in water with

the aid of an organic protective colloid having adhesive properties; and finally washing the pulp.

2. A process for de-inking printed paper comprising the steps of pulping the paper in the presence of a solution of alkaline character; then subjecting the pulp, under agitation, to treatment with an aqueous composition, made by causing a mineral silicate having detergent properties to become as finely sub-divided as possible in water with the aid of an organic protective colloid having adhesive properties; and finally washing the pulp.

3. A process for de-inking printed paper comprising the steps of pulping the paper in the presence of a solution containing caustic alkali; then subjecting the pulp, under agitation, to treatment with an aqueous composition, made by causing soapstone to become as finely sub-divided as possible in water containing casein in solution; and finally washing the pulp.

4. A process for the removal of printer's ink from paper, comprising the steps of pulping the paper; and then mixing the pulp with an aqueous composition contain-

ing a finely-divided mineral silicate and casein.

5. A process for the removal of printer's ink from paper, comprising the steps of pulping the paper; and then mixing the pulp with an aqueous composition containing finely-divided soapstone and casein.

6. A process for the removal of printer's ink from paper, comprising the steps of pulping the paper; mixing ground soapstone with water; adding thereto a semi-solution of casein; grinding the resultant mixture; mixing the paper pulp and ground mixture together; agitating the final mixture; and then subjecting said final mixture to washing.

7. A process for the removal of printer's ink from paper, comprising the steps of pulping the paper; grinding a detergent mineral substance in the presence of an organic protective colloid having adhesive properties; mixing the paper pulp and ground mixture together; agitating the final mixture; and then subjecting said final mixture to washing.

In testimony whereof I affix my signature.

LADISLAUS E. GRANTON.