

UNITED STATES PATENT OFFICE

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MANUFACTURE OF PAPER MAKING MATERIAL

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This invention relates to improvements in the manufacture of paper making in order to recover pulp by deinking of old printed paper.

5 The characteristic feature of this invention is to make an emulsion of camphor oil, a solvent of printing ink and dry printing ink, by the action of suitable dispersing medium such as soap solution, and to mix the resultant
10 emulsion of camphor oil with old printed paper treated with alkali and thereby de-ink by the dissolution and dispersion of ink matter into the said dispersed solvent oil.

15 The object of this invention is to attain the deinking of old printed paper easily and completely so it can recover a useful paper making material having the same grade to that of the old paper used by a simple and economical process.

20 Heretofore old printed paper has not been utilized as a raw material for the recovery of high grade paper pulp on account of the difficulty of deinking. But, by the improved method of this invention this old printed
25 paper may be satisfactorily used as a raw material for the same purpose, and also a successful utilization of such waste matter as old printed paper can be attained, of which there is an immense supply.

30 This invention is preferably carried out as follows: To make an emulsion of camphor oil a solution of soap made of any sort of fats or oils such as soap of sesame oil is used as the dispersing medium.

35 To explain this more fully about 30 lbs. of the said soap of sesame oil is dissolved in a proper quantity of water, this solution is then mixed with about 18 litres of camphor oil, the resultant mixture is then violently
40 agitated thus producing the emulsion of camphor oil.

45 The next treatment is the tearing or breaking up of old printed paper. For this tearing a paper making kneader is used, and for about 1,000 lbs. of the quantity of old paper the aforesaid emulsion of camphor oil together with about 3 lbs. of caustic soda solution and a proper quantity of water are
50 poured down into the kneader through respective supply pipes provided at the charg-

ing part of the kneader. In kneading of this paper mixture old paper is greatly softened by the action of coexisting chemicals such as caustic soda and emulsion of camphor oil, so that the kneading action proceeds much earlier and easier than when kneading takes place with water only.

55 The kneaded paper mixture, which is black in colour, when discharged from the kneader, is then poured down into the paper making potcher or the mixer and in this apparatus it is agitated by a constant rotation for about thirty minutes. During this agitation in the potcher or the mixer dry printing ink fixed on old printed paper is completely peptized into minute particles, and as a result
60 of this the pigment most contained in printing ink such as lamp black is also completely suspended in the dispersed solvent oil. This dispersed mixture, therefore, contains minute particles of peptized ink matter so that if this mixture is scooped up and pressed in the hands there will be separated a blackish muddy liquor from the mixture and a white paper fibre will remain in the hands. From
65 this experiment it is clearly known that pigments and other constituents of printing ink are completely peptized into very minute particles in the dispersed solvent oil so as to be capable of free passing through filter paper of the qualitative analysis.

70 The aforesaid strong peptization of dry printing ink (containing pigment, varnish etc.) fixed on old printed paper by the action of dispersed solvent oil comprising a mixture of emulsion and caustic soda solution, will be explained as below.

75 Camphor oil, in general, is a good solvent of dry varnish in printing ink, and if camphor oil is added to old printed paper in a form of emulsion there can be attained the result of filling the paper with camphor oil in a great volume. When varnish in ink is dissolved in the dispersed solvent oil it then forms a colloidal varnish, and as it is a substance easily emulsified by soap solution
80 varnish once dissolved in camphor oil it now begins to separate from the solution in a form of colloid by the aid of agitating or stirring action and at the same time the dissolving ac-

tion of remaining varnish into solvent oil is again proceeded.

Moreover camphor oil has the property of dissolving rosin present in old printed paper, and therefore it greatly weakens the chemical affinity between varnish and rosin by its presence resulting in the separation of varnish and rosin.

The soap solution itself, at the same time causes a peptizing action of varnish and rosin in the kneaded paper.

Caustic soda, on the other hand, is utilized to neutralize acidity derived from acid materials in paper such as sulphuric acid in alum-cake, alum and sizing materials such as rosin, and thus it can prevent the emulsion from its coagulation by acid and keeping the emulsion in good stability. Moreover caustic soda solution acts to excite the peptization of varnish and rosin in paper, so that by this action size of paper is destroyed and the chemical affinity between water and fibre can be promoted, while the chemical affinity between varnish, fibre and rosin being remarkably weakened. A greater part of black muddy liquor, which is completely peptized during the agitation in the potcher or the mixer, may be separated by using an apparatus such as centrifugal separator. The remaining fibre of paper thus gained is then poured into the potcher or the mixer with water. Thereupon it is repeatedly washed by the drum washer or it may be poured down into a tank having a mat stretched over its bottom and provided with agitators and in this tank the muddy liquor now becomes filtered and separated.

In actual practice of this washing process there rarely appear minute black spots on the washed pulp mixture even when its quantity is very small. But these spots will completely vanish by washing and adding a small quantity of alkali, as the said phenomena of black spots appearing is chiefly due to lack of the alkalinity of the kneaded paper mixture. Moreover this vanishing effect is better attained when a small quantity of soap is added with alkali. The resultant product after the washing is completely deinked and the fibre has the same quality as that of the fibre consisting of old printed paper, can be obtained.

The produced material thus gained is then wrapped by a wet machine and made up to dry pulp by a pulp machine or paper by a beater.

I claim:

Process for manufacturing paper consisting in first preparing an emulsion of camphor oil, a good solvent of printing ink and dry printing ink by the action of soap solution as dispersing medium, then mixing the resultant emulsion with old printed paper previously treated with an alkali and finally deinking the old printed paper by dissolving

and dispersing the ink matter in the said dispersing medium.

In witness whereof I have hereunto set my hand.

NAOSHIGE OSAWA.

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