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PATENT SPECIFICATION

NO DRAWINGS

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COMPLETE SPECIFICATION

Improvements in or relating to the preparation of Lower Grade Natural Rubbers and Skim Rubbers

We, THE BOARD OF THE RUBBER RESEARCH INSTITUTE OF MALAYA, of 3rd Mile Ampang Road, Kuala Lumpur, Malaysia, a Body Corporate of Malaysia, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is for improvements in or relating to the preparation of lower grade natural rubbers and skim rubbers and has for an object to provide a process which will improve the properties of such lower grade natural rubbers so that they may be more useful commercially.

The lower grade solid natural rubbers are obtained on the plantation in the form of cup lumps, tree lace or earth scrap and from centrifuges used in the production of a concentrated latex in the form of skim rubber. The cup lumps are those coagulated portions of the latex which form in the cups collecting the latex on the trees and this material may well contain over 90% of rubber hydrocarbon solids.

Tree lace are the small lacy portions of coagulated rubber which form on and around the cuts on the trees, whilst earth scrap is, of course, the rubber recovered from the earth surrounding the trees and these forms of low-grade rubber will be inferior to the cup lumps. Skim rubber may contain as much as 20 to 30% of non-rubber solids and the raw ageing properties thereof are invariably poor and are very inferior to the raw ageing properties of cup lumps.

In our British Patent Specification No. 1,122,463 we have described the effectiveness of oxalic acid in improving the raw ageing (oxidisability) properties of lower grade solid natural rubbers, such as arise from cup lumps, tree lace, earth scrap and skim rubber. We have now discovered that phosphoric acid solutions are almost as effective as oxalic acid solu-

tions and are less toxic and cheaper in cost. The use of phosphoric acid solutions for improving the raw ageing characteristics of the lower grade forms of natural rubber and skim rubbers, is of direct benefit to producers and consumers of natural rubber.

According to the present invention, therefore, we soak the lower grade solid natural rubbers in the form of crumbs or crepe in an aqueous phosphoric acid solution; it is preferable to carry out the soaking treatment for a period of at least two hours and it is also preferable that the concentration of the phosphoric acid solution should lie in the range of 0.15% to 0.5% by weight.

We have found that the phosphoric acid solutions can be used for the treatment of a number of successive amounts of the lower grade rubbers; solutions have been successfully used for as many as six soaking treatments.

The following examples illustrate the manner in which the invention may be carried into effect:—

EXAMPLE I

Cup lump and tree lace materials were creped and crumbled using castor oil. The crumbs were then soaked in the following solutions for a period of 2 hours prior to drying:—

1. Water
2. 0.2% Oxalic Acid
3. 0.2% Phosphoric Acid

The dried crumbs were then tested for oxidizability, i.e. a standard piece was heated at 140°C for 30 minutes and Wallace plasticity measured before and after so ageing. The Plasticity Retention Index (RPI) which is an index of oxidisability is calculated by dividing final plasticity by initial plasticity and multiplying by 100. Table I shows the results obtained from the foregoing experiments.

[Price 4s. 6d.]

TABLE I

Soaking Solution	Cup Lumps			Tree Lace		
	Wallace Plasticity		PRI $\frac{B}{A} \times 100$	Wallace Plasticity		PRI $\frac{B}{A} \times 100$
	Before Ageing (A)	After Ageing (B)		Before Ageing (A)	After Ageing (B)	
Water (Control)	53	39	74	46	13	28
0.2% Oxalic Acid	49	45	92	45	18	40
0.2% Phosphoric Acid	46	41	89	47	23	49

EXAMPLE II

Skim latex obtained from a latex centrifugation process was coagulated and crumbled in conventional manner. The crumbs were divided into lots and soaked in solutions of

water, oxalic acid and phosphoric acid for a period of 2 hours prior to drying. The dry crumbs were then tested for oxidisability (PRI). Table II shows the results obtained in the foregoing experiments.

TABLE II

	Wallace Plasticity		$\frac{B}{A} \times 100$
	Before Ageing (A)	After Ageing (B)	
Water (Control)	75	23	31
0.2% Oxalic Acid	70	59	84
0.2% Phosphoric Acid	68	51	75

The above Examples clearly illustrate the advantage obtained in the use of phosphoric acid in enhancing the heat ageing characteristics of solid wet lower grades of natural rubber and skim rubbers.

WHAT WE CLAIM IS:—

1. A method for the preparation of lower grade solid natural rubbers which comprises treating the said rubbers in the form of crumbs or crepe by soaking in an aqueous phosphoric acid solution.

2. A method according to claim 1 wherein the soaking treatment is carried out for at least two hours.

3. A method according to claim 1 or claim 2 wherein the concentration of the phosphoric acid is from 0.15% to 0.5% by weight.

4. The method for the preparation of lower grade natural rubbers by soaking in an aqueous phosphoric acid solution substantially as described.

5. Lower grade natural rubbers in the form of crumbs or crepe when prepared by the method claimed in any of the preceding claims.

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Chartered Patent Agents,
Agents for the Applicants.



* C L M S *

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