

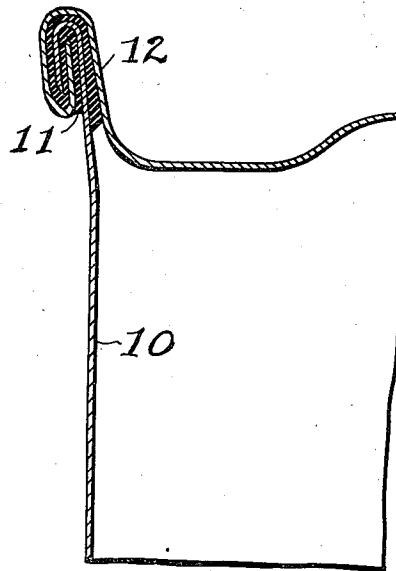
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CONTAINER CLOSURE AND LINING COMPOSITION

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CONTAINER CLOSURE AND LINING
COMPOSITIONKenneth Tator, Egypt, Mass., assignor to Dewey
and Almy Chemical Company, North Cam-
bridge, Mass., a corporation of MassachusettsApplication July 25, 1940, Serial No. 347,541
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6 Claims. (Cl. 260—750)

This invention relates generally to the art of container closure and specifically is directed to the production of a superior lining compound. Among the objects of the invention are to provide a method of incorporating substantial amounts of fibrous fillers in the compound without at the same time unduly increasing its viscosity; to prevent substantial hydration of the fibre; and to produce a fibre-reinforced lining compound.

These and other objects will become apparent from the specification and from the drawing in which the single figure represents a greatly enlarged cross-section through a portion of a double seamed can body and end.

The present application is a continuation-in-part of my divisional application, Serial No. 196,800, filed March 18, 1938, which application contains subject matter divided from my Patent No. 2,134,217, patented October 25, 1938. My patent contains claims covering the process of preparing water-resistant sealing gaskets on container closures and the resulting article of manufacture, while the claims of the present application are directed to the novel water-resistant compound and the process of manufacturing the same.

It has been the previous experience that organic or mineral fibres (type substances are cellulose and asbestos) cannot be added to a water-dispersed can-lining compound in substantial amounts because such fibres hydrate readily and form sluggish viscous masses quite unsuitable for can lining purposes. For example, a water slurry containing 8% of dry fibre is too stiff for the purposes of this invention. The controlling factor is, of course, the viscosity limits which are rigidly set by the nature of the lining machinery and the configuration of the can ends used.

If rubber and wood pulp or cotton fibres are worked on a rubber mill, the fibre is drawn into the rubber by the apparent process of wetting. It is my belief that the rubber particles wet the individual cellulosic fibres and also that this wetting is preferential and persists in the presence of water. In certain cases, notably with news pulp, the amount of dried fibre which can be carried in may equal the weight of the rubber. In certain other cases, as when cotton linters or cotton flock are used, this proportion cannot be obtained without producing a stock which is too short to follow or work on the mill. In such a case I follow the procedure outlined by W. B. Wescott, U. S. Patent No. 1,702,225, and beat the fibres to form a slurry, then add latex, and pre-

cipitate rubber upon the fibres in the manner he has described. When dried, such coated fibres may be milled into a rubber mass over a very wide range of proportions. If asbestos be used, I consider it advantageous but not strictly necessary to precoat the fibres with rubber latex and in such case I may utilize the process set forth by G. R. Tucker in U. S. Patents Nos. 1,907,616 and 1,907,617.

I have discovered that such high fibre content mixtures can be dispersed under certain conditions and that the coated (or rubber wetted) fibres do not hydrate in a comparable degree to untreated fibres in water. Without regard to the accuracy of my explanation of this effect, I note as a fact that I am able to produce a water dispersed lining compound containing one part of fibre to one part of rubber solids and still have a viscosity which is suitable for lining machine requirements.

I have also discovered that this effect is not limited to rubber or its analogues but occurs generally whenever a substantially non-hydratable body is used. For example, excellent low viscosity dispersions based on asphalt, paraffin and waxes may also be made.

It is widely believed that the dispersion of rubber in water is brought about by the repeated stretching of the rubber mass and the introduction of water between the rubber globules with each extension. It is also stated that the protective colloid serves both to carry in the water and to coat the rubber globules to prevent their re-coalescence. Whether this be true or not, the fact remains that rubber to disperse well in a mixer must originally possess some "nerve." The mixture of one part fibre, one part rubber is, however, soft and crumbly and cannot be dispersed with the cheap and commonly used dispersing agents such as kaolin and bentonite. They are unctuous and slippery. Soap dispersing agents also fail. But, I have found that the property of "nerve" need not reside in the rubber, but may be introduced as an attribute of the colloid. Substances such as casein, glue, gelatin, karaya, sea moss and the algin attach themselves so firmly to the rubber and have such high self-cohesion that the pulling and stretching of the rubber necessary to produce a dispersion can be brought about.

The seal produced by my compound is illustrated in the figure, a sectional view through a portion of the can body and end after the double seaming operation. The gasket 11, formed from the dispersion, is enfolded in and locked between

the can body 10 and the can end 12. The distinguishing feature of such rubber deposits from water dispersions is the retention in the rubber aggregate of the physical constituents which characterized them in water dispersion, whereas the physical constituents of the aggregates derived from the evaporation of rubber "solutions" are disrupted and materially changed.

As a specific example of my invention, 350 parts of rubber and 350 parts of news print pulp are worked dry on a differential roll mill until the fibre is fully absorbed. The mass is then put into a Baker-Perkins mixer and worked with 100 parts of casein mixed with 150 parts of ammonia water (28% NH_3). Additional water to the amount of 1500 parts is run into the mixer bit by bit as the process continues. The mixing is continued until the rubber is thoroughly dispersed and a smooth paste is formed. Compounding ingredients may be added to the mass which may be viscosity or plasticity factors such as are disclosed in the patent to Dewey and Crocker, No. 1,765,134, or they may be vulcanizing agents. The addition of such factors has no effect on the general nature of the dispersion I produce.

In the same general manner, I am able to produce dispersions of wool, cattle hair, shoddy, or asbestos. As I have previously stated, my invention is not limited to coating the fibres with rubber, or like substances alone, but asphalt, waxes and paraffin may be used in the manner specified. In the case of wax the addition of an ethanol amine may be found helpful—and in all cases a disinfectant or preservative aids when the dispersions are to be stored.

The above formula is, accordingly, given for illustrative purposes only and no limitation is intended by reason of the materials given or the proportions stated therein. Those familiar with the art will recognize that the proportion of fibre which can be added may vary through wide limits and that my invention possesses general utility whenever it is desired to produce a dispersion containing substantial quantities of fibre.

In the appended claims the term "dispersion"

is employed to indicate a system involving a continuous phase and at least one dispersed phase wherein the continuous phase comprises water, and the discontinuous or dispersed phase comprises solid particles freely suspended in the continuous phase. Such a system is distinguished from a mere mixture by the fact that the dispersed phase is stable and does not have any substantial tendency to settle out.

10 I claim:

1. The method of making a stable aqueous dispersion which comprises milling cellulosic fibres into rubber to coat the fibres with rubber and then intensively working the resulting mass with 15 water and a dispersing agent selected from the class consisting of casein, glue, gelatin, karaya, sea moss and algin to disperse the mass as a stable disperse phase in water.

2. That method of producing a water dispersion containing rubber and a substantial proportion of fibre both in the disperse phase which includes the separate steps of coating said fibre by coagulating latex thereon, incorporating said coated fibres in an additional quantity of rubber 25 by milling and then forming a dispersion by working the milled batch in the presence of water and a material selected from the class consisting of casein, glue, gelatin, karaya, sea moss and the algins.

3. The method of making a stable aqueous dispersion which comprises milling cellulosic fibres into a water-repellent substance selected from the class consisting of rubber, asphalt, paraffin, and waxes to coat the fibres with said substance and then intensively working the resulting mass with water and a material selected from the class consisting of casein, glue, gelatin, karaya, sea moss and algin to disperse the mass as a stable disperse phase in water.

4. A stable aqueous dispersion, being the product of the process of claim 1.

5. A stable aqueous dispersion, being the product of the process of claim 2.

6. A stable aqueous dispersion, being the product of the process of claim 3.

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