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PROCESS FOR IMPROVING FOLDING ENDURANCE

John W. Koning, Jr., Madison, Wis., assignor to the United States of America as represented by the Secretary of Agriculture

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ABSTRACT OF THE DISCLOSURE

This invention relates to a process for improving the folding endurance of fiberboard containers that have been treated to increase the strength properties of the container. The invention is carried out by prefolding the treated fiberboard prior to curing the treatment impregnant.

A nonexclusive, irrevocable, royalty free license in the invention herein described throughout the world for all purposes of the United States Government, with the power to grant sublicenses for such purposes, is hereby granted to the Government of the United States of America.

A difficulty which arises in the use of treated containers, especially where a fiber stiffening agent is used as an impregnant, is the embrittlement of the fiberboard. For example, when corrugated fiberboard containers constructed from treated paperboards are set up and the flaps folded, fracture of the paperboard sometimes occurs at the vertical and horizontal scorelines, thus resulting in an unfavorable structure.

Accordingly, an object of this invention is to provide a method for preventing the formation of fractures in a fiberboard container upon bending or folding of said fiberboard.

Other objects which will become apparent to those skilled in the art will appear in the specification and in the appended claim.

Various agents are used to treat fiberboard for use in structures, depending on the characteristics desired in the final product. For example, if corrugated fiberboard is used to construct containers, said fiberboard may be treated with a variety of agents to increase strength or to resist the penetration of moisture. Many of the chemical agents used in treatment become rigid or brittle upon polymerizing or hardening, thereby causing the fiberboard to become embrittled and to crack or fracture upon bending or folding.

The concept herein described which permits the bending or folding of treated areas is that of preworking the treated fiberboard at the scorelines or other areas where the material is to be folded, prior to the curing of the impregnant therein. One procedure which may be utilized in the practice of the presently described invention is as follows:

The fiberboard is treated and cut into any desired shape, depending upon the structure to be formed therefrom. Prior to the curing of the treated fiberboard, all areas that are to be folded or bent are preworked by bending said areas to the greatest extent possible. For example, the flaps in a conventional container may be conveniently folded through an arc of at least 330 degrees, while the corners may be folded through an angle of 180 degrees.

After the fiberboard has been thus preworked, the impregnant therein is cured by heat or other suitable means.

In further illustration of this invention, the following example is given:

Example

Two sets of identical resin treated corrugated fiberboard containers were exposed to a temperature of 360 degrees F. for 35 minutes in order to cure the impregnant therein. Prior to this exposure, the material was preworked at the scorelines of one set of containers by rotating the panels through an arc of about 180 degrees, and the flaps through an arc of about 330 degrees. After exposure to the aforesaid elevated temperature, the containers in each set were set up and the flaps folded in through an arc of about 90 degrees. Severe cracking and, in some instances, complete separation of the flap from the side panels occurred at the scorelines of the set of containers that were not preworked. The flaps of those containers that had been preworked could be folded through an arc of at least 90 degrees without severe cracking.

Having thus described my invention, what is claimed is:

1. The method for improving folding endurance in treated fiberboard containers comprising treating the fiberboard containers with a stiffening resin, then preworking said containers at the intended scorelines and folding areas, and then curing said resin.

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BERNARD STICKNEY, *Primary Examiner.*