

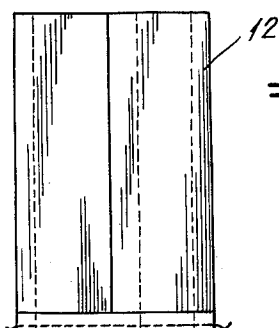
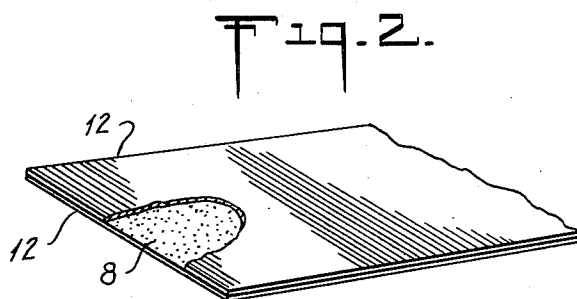
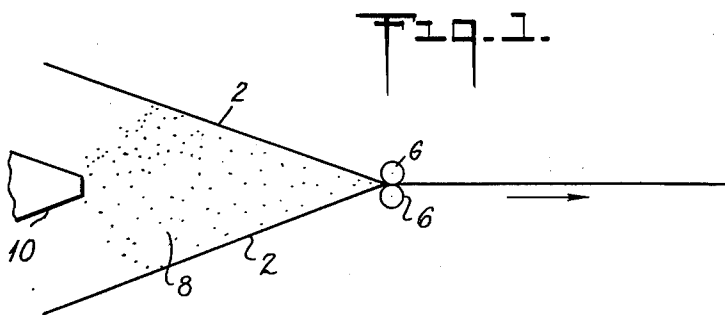
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BAG, COMPOSITE MATERIAL, AND METHOD OF MAKING

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2,792,326

BAG, COMPOSITE MATERIAL, AND METHOD OF MAKING

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5 Claims. (Cl. 154—138)

The present invention relates to composite material of plain or flat paper and method of forming the same, and further relates to a bag made of said material.

The principal objects of the invention are to provide a novel and improved composite material, bag, and method of forming the composite material.

The several features of the invention, whereby these and other objects may be attained, will be readily understood from the following description and accompanying drawing in which:

Figure 1 is a diagrammatical side view of two paper webs and showing guide rollers between which the webs pass, and a nozzle for spraying material over the opposed surfaces of the webs as they approach said rollers;

Fig. 2 is a view in perspective of two webs that are secured together in superposed relation in accordance with the invention; and

Fig. 3 is a side view of a multi-wall plain or flat paper bag which may be made of the composite material illustrated in Fig. 2.

In accordance with the present invention, two flat or plan paper webs 2 (Fig. 1) are fed longitudinally in superposed relation and are brought together as they pass between rollers 6. These rolls 6 serve to position the webs together without exerting material pressure thereon. As the webs 2 approach the rollers 6, their inner or opposed surfaces are sprayed with an aqueous dispersion of particles 8 of pressure sensitive elastic adhesive by means of an air pressure nozzle 10. The amount of coating thus applied may be varied with the speed of the webs. After the webs pass between the rollers 6 and the adhesive particles become set, they are evenly secured together.

By spraying the pressure sensitive elastic material over the opposed surfaces of the paper as above described, it has been found that the plies of the material are uniformly secured together, and in case portions of the plies should become separated due to strain or other causes, they readily re-adhere.

The flat paper composite material illustrated in Fig. 2 is particularly adapted for use in forming multi-wall bags such as illustrated in Fig. 3, the several plies of which being secured together by the closely spaced pressure sensitive adhesive particles. As shown this bag is provided with gusseted sides 5', but the material may also be employed for ungusseted bags. Heretofore in the case of such flat paper multi-wall bags considerable difficulty has been experienced in evenly laying the plies in close contact with each other, the plies not uniformly resisting bursting strains. By thus attaching the plies together, however, it has been found that plies may be more evenly laid in close contact, and the several plies uniformly reinforce each other and resist bursting and other strains. In case portions of the plies should become separated, they readily re-adhere and the original status of the plies in the bag is regained. The particles of elastic adhesive and the dead air spaces between them tend to ease or cushion shock and stress when the filled bags are

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dropped or thrown. The adhesive prevents friction between the plies, tends to bond the fibers of the paper, and the plies are more completely held in place and yet are permitted to act independently.

The adhesive material having the characteristics above described may be formulated from a natural or synthetic rubber stock reclaimed according to methods standard in the industry. This stock is dispersed in water according to standard procedure fully described in the patent to Pratt No. 1,775,569. To this dispersion twelve parts of hydrogenated type resin or other resin designed primarily for the purpose of providing tackiness is added. The rubber stock may be composed of 30 to 100% rubber hydro-carbon with the balance non-rubber material. The compound should be such as to retain its tackiness between the plies through low and high temperatures in the range of -20° F. and 250° F.; and should be more or less non-penetrating so as to form a surface adhesion. Examples of two formulas which may be used are as follows:

Formula 1

	Parts
Zinc carcass reclaim	100
Hydrogenated rosin or resin	12
Dispersing agent	5

to which water is added to bring resultant mix to 62% solids.

Formula 2

	Parts
Zinc carcass reclaim	100
Hydrogenated rosin or resin	18
Dispersing agent	5
Deodorizing agent	6

to which water is added to bring resultant mix to 62% solids.

It will be understood, however, that any suitable pressure sensitive elastic material dispersed in water for spraying purposes may be employed. The spraying preferably is performed by means of a whirling volume of air so as to cause minute particles of the dispersion to be thoroughly mixed in a cloud-like spray as they are blown against the material. This insures even distribution of the particles in closely spaced relation.

In the manufacture of multi-wall bags made from flat kraft paper, the amount of pressure-sensitive adhesive particles applied between the plies is preferably of the order of from 2 to 6 pounds per ream of paper employed in the bags, the ream being determined on the basis of 24 by 36 inches, 500 sheet count. However, in certain instances, as for example because of the quality of the paper, as much as twelve pounds per ream may be desirable.

Irrespective of the quantity of adhesive thus employed, in order to obtain the best results it should be uniformly applied as above described between the plies. The adhesive may be sprayed in a fine mist resulting in minute discrete particles being deposited, or sprayed in such a manner as to form somewhat larger discrete particles, for example particles of substantially 1/16 of an inch in diameter.

The adhesive may be sprayed on the two plies simultaneously as shown in Fig. 1, or may be sprayed upon only one ply. In either case when the plies are brought together only sufficient pressure should be applied to cause adherence without penetration of the fibers of the plies. This insures dead air spaces being provided between the spaced points of adherence of the plies, and prevents relative slippage of the adjacent plies. Also it enables the plies to re-adhere readily when separated.

This application is a continuation in part of our ap-

plication Serial No. 88,765, filed April 21, 1949, now abandoned.

What we claim is:

1. A multi-wall bag of flat paper having the plies thereof secured together substantially throughout their areas by closely spaced particles of pressure sensitive elastic adhesive, the adhesive particles where located spacing the plies apart so as to provide dead air spaces between them, and the adhesive being such that in case the points of adherence of portions of the plies become broken owing to separation of said portions, the adhesive particles serve to re-adhere said portions when they are again pressed together.

2. The method of forming composite material from a plurality of webs of flat paper which comprises feeding the webs longitudinally and bringing them together in superposed relation at a predetermined point in their travel, and spraying an aqueous dispersion of pressure sensitive elastic adhesive material over the opposed surfaces of the webs as they approach said point in their travel, whereby the webs are adhesively secured together by said particles at closely spaced points, the adhesive particles where located spacing the plies apart so as to provide dead air spaces between them, and the adhesive being such that in case the points of adherence of portions of the plies become broken owing to separation of said portions, the adhesive particles serve to re-adhere said portions when they are again pressed together.

3. A multi-wall bag of flat paper having the plies thereof uniformly secured together at closely spaced points by discrete particles of pressure-sensitive elastic adhesive, said adhesive effecting only surface penetration so as to provide dead air spaces between said spaced points of adherence of the plies, and the adhesive being such that in case the points of adherence of portions of the plies become broken owing to separation of said portions, the adhesive particles serve to re-adhere said portions when they are again pressed together.

4. The method of forming composite material formed

from a plurality of webs of flat paper which comprises longitudinally feeding webs of paper to form the plies of the composite material, bringing them together in superposed relation at a predetermined point in their travel, and spraying an aqueous dispersion of pressure-sensitive elastic adhesive uniformly over at least one of the opposed surfaces of the webs as they approach said point in their travel, whereby the webs are adhesively secured together by said particles at closely spaced points, the quantity of the adhesive particles applied between the plies being from 2 to 10 pounds per ream, and there being only surface penetration of the adhesive particles so as to provide dead air spaces between said points of adherence of the plies, and the adhesive being such that in case the points of adherence of portions of the plies become broken owing to separation of said portions, the adhesive particles serve to readhere said portions when they are again pressed together.

5. Composite material comprising a plurality of sheets of flat paper uniformly secured together at closely spaced points by discrete particles of pressure sensitive elastic adhesive, said adhesive effecting only surface penetration so as to provide dead air spaces between said points of adhesive of the plies, and the adhesive being such that in case the points of adherence of portions of the plies become broken owing to separation of said portions, the adhesive particles serve to re-adhere said portions when they are again pressed together.

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