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MANUFACTURE OF MOISTUREPROOF PAPER PACKAGES

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Fig. 1

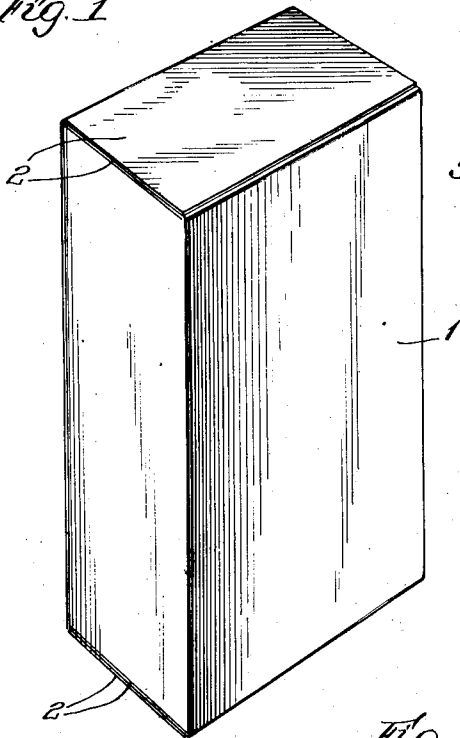


Fig. 2

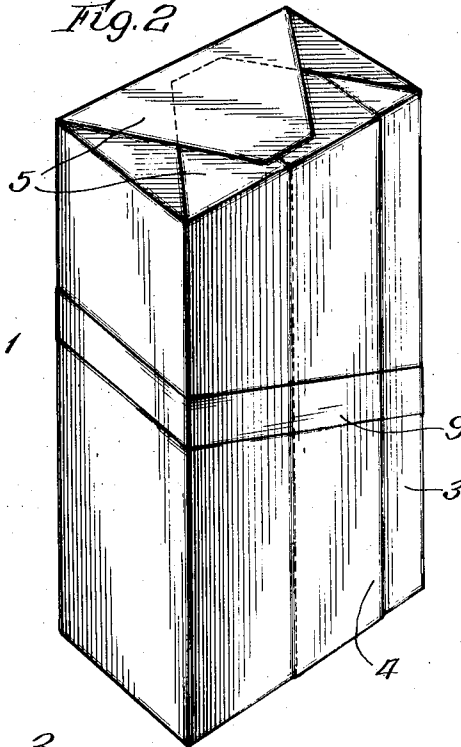


Fig. 3

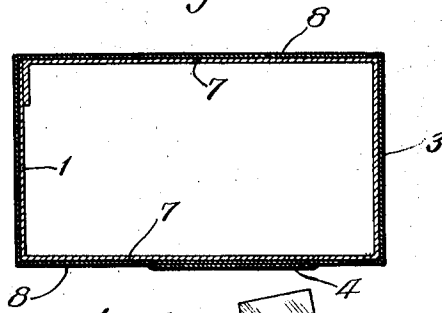
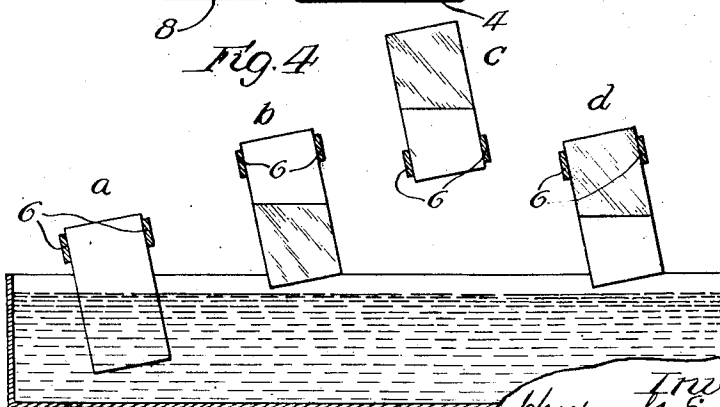


Fig. 4



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UNITED STATES PATENT OFFICE.

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MANUFACTURE OF MOISTUREPROOF PAPER PACKAGES.

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The invention presented relates to the manufacture of paraffined paper packages for marketing candies, popcorn confection, and other food products that are readily affected and rendered unsalable by the absorption of small amounts of moisture.

It has been found that a paper package or wrapper containing paraffin wax only in its fibrous body or having only a slight coat or surface film of wax that is easily cracked or broken or that leaves the fibers of the paper exposed, will not effectively prevent the passage of water vapor, but for efficient protection, the completed, filled packages must have a substantial, unbroken film or coat of paraffin wax extending throughout its walls and including its folds or joints. Such a protecting film cannot be provided if the folds of a paraffined paper wrapper are sealed by heat unless the wrapper originally has a very heavy surface coat sufficient to withstand the sealing heat which tends to disperse it. But the amount of paraffin coat that it is commercially practical to apply to a paper sheet, is limited, so that in sealing, it is difficult to avoid overheating the wrapper. As set forth in my co-pending application which resulted in U. S. Letters Patent No. 1,451,145, dated April 10, 1923, to overcome the above-noted difficulties, the filled packages are enclosed in a waxed, heat-sealed wrapper and then immersed in melted wax to provide a protecting coat. But difficulties have been encountered in providing a commercially practical method of dipping the packages which will insure a satisfactory protecting coat and employing the wax economically. Thus the best method heretofore proposed has been to completely immerse each package while gripped by a suitable holder and drain it with one corner or edge lowermost. But if the bath of wax is at a sufficient high temperature to insure good drainage as the package is withdrawn from the bath, it will collect at the lower end of the package so that while this portion may receive a sufficient coat, the other portions of the package will not. Also the package holders become coated with wax and hence will not readily release the packages and such holders or grippers frequently prevent the formation of a good protecting coat at the point of contact thereof with the package.

The present invention seeks to remedy the above noted difficulties and, with these and

other objects in view as will presently appear, consists in the features of improvement hereinafter set forth and more particularly pointed out in the appended claims.

In the accompanying drawings, which show the form of package to which the invention is particularly directed:

Fig. 1 is a perspective view of the inner wrapper or carton.

Fig. 2 is a perspective view of the finished package.

Fig. 3 is a cross-sectional view thereof.

Fig. 4 is a view illustrating the manner of applying the finishing coat of paraffin.

The inner carton is preferably made of stiff paper board and is of the usual form, comprising an elongated, rectangular body 1 and the customary end flap 2 that are folded inwardly to enclose the contained goods. Preferably to prevent the confections, or other like goods from sticking to the carton, it is lightly coated with paraffin and preferably also, it is heated and so dried to remove the greater portion of the contained moisture. The body of such a paper board carton will usually contain 5 or 6 percent of moisture dependent upon the atmospheric conditions and this amount of moisture is preferably reduced by drying to 2 or 3 percent just before the carton is filled and enclosed in the sealing wrapper, particularly if the goods to be packed readily absorb moisture.

The sealing wrapper 3 comprises a sheet of medium weight paper which is flexible so that it can be readily folded and which is sufficiently waxed to provide a heavy coat so that it can be quickly and easily sealed by the application of heat and pressure. Preferably manilla or bleached sulphite paper weighing between 20 to 35 pounds per standard ream before waxing is employed, and the paper carries sufficient wax—from 10 to 35 pounds per ream—to provide a substantial surface coat of wax on both sides of the sheet in addition to the wax in its body. The paraffined sealing wrapper is folded about the inner filled package and the overlapping side seam 4 of the wrapper and the usual folds 5 at the opposite ends of the package are heated to partially melt the wax coat and are pressed into snug engagement until the melted wax is cooled and set to tightly seal the side seam and end folds at all points.

The wrapped and sealed package is then

dipped in a bath of melted paraffin for a few seconds, and after removal from the bath, it is cooled by exposure to the air or to a cooling air blast to set the wax and provide a uniform, continuous film over all parts of the package. Paraffin wax having a melting point of from 125 degrees to 145 degrees F. is employed and best results are obtained with wax of high melting point. The bath should be maintained at a temperature of about 15 to 20 degrees above the melting point of the wax, care being taken that the temperature be high enough to insure proper draining of excess wax and also to avoid excessive temperatures which would tend to open the sealed folds of the package. Also to prevent the heat of the bath from opening the sealed folds, the packages should be allowed to cool or be chilled if necessary to about room temperature after they are wrapped and sealed by the application of heat and before they are dipped in the bath.

To provide a uniform coat and particularly over the folds 5 at the opposite ends of the package, the package is dipped as diagrammatically indicated in Fig. 4. That is to say, the lower portion of the package is dipped and slowly withdrawn from the bath in a substantially vertical direction while supported by hand or by suitable grippers 6 which engage its upper undipped portion as shown at *a* and *b* in Fig. 4. Also to avoid the formation of air bubbles as it is dipped and to insure proper draining of excess wax from the lowermost edge as it is withdrawn from the bath, the package is inclined or held at an angle to the vertical as shown. The time of immersion should vary with the temperature of the bath, but with the temperatures indicated good results are obtained with an immersion of from 6 to 12 seconds. It is particularly desirable to slowly and quietly withdraw the package to permit the draining of excess wax and the setting of a substantial uniform coat on the dipped portion as it is so withdrawn. Preferably, after withdrawal, the package is promptly inverted as shown at *c*, Fig. 4, so that any further draining is back onto the package, and it is so held until the wax coat on the immersed portion of the package is fully congealed. The coated portion of the package is then engaged by hand or by grippers, as shown at *d*, Fig. 4, and the opposite end portion is immersed, withdrawn and inverted in the same manner to provide a coat over the other half of the package and over its opposite end folds.

By thus treating the package a superficial coat or film to the extent of about $1\frac{1}{2}$ to $2\frac{1}{2}$ pounds per 100 square feet will be added, and, since the package has been previously enfolded and tightly sealed in a paraffin wrapper having a surface coat, the added wax cannot penetrate or be absorbed by the walls of the package or seep in through its folds or joints.

Nor will a film be formed which will be readily broken or chipped off. Instead the additional wax will firmly unite or become fused or welded to the wax already on the wrapper, forming a heavy, superficial coat which will seal up all minute cracks and imperfections in the sealing wrapper and in particular will cover and repair any portions of its film which may have been broken down by the heating and sealing of its folds. Again, since a previously waxed wrapper is employed, the amount of wax added by dipping can be more readily controlled and more effectively and economically employed to provide the uniform film or coat than would be possible if an unwaxed, glued or pasted wrapper were used. Furthermore, the two-stage method described of separately dipping portions of the package while it is held by an undipped portion, provides an effective uniform coat throughout and particularly where most needed, namely, over the folds at both ends; whereas it is quite difficult to obtain satisfactory results by completely immersing the package and its supporting means. In Fig. 3 of the drawing, the black line 7 indicates the wax coat on the inner surface of the wrapper and between its folds, and the heavier line 8 is intended to indicate the film formed by its outer coat and the wax added thereto by the dipping operation and which, as stated, extends over the entire surface of the package including its side seam and the end folds. The overlapping portions of the coat provided by the two-stage method of dipping is indicated at 9 in Fig. 2.

The folding, sealing and dipping operations may be carried out in various ways but preferably suitable machinery is employed. In dipping the opposite end portions of the package it is preferably immersed to such an extent that, as indicated, the coats overlap, but if the wrapper is originally provided with a very heavy surface coat or film, good results can be obtained by immersing the opposite end portions to a less extent. Usually, to protect the finished package from injury, it will be enclosed in an outer wrapper of paper or paper board.

The procedure described provides a cheap paper package of great efficiency in excluding air and water vapor from goods such as candied pop-corn that is highly sensitive to moisture. The package is also of value in marketing goods like marshmallows which become stale by losing moisture.

Obviously, the details may be varied without departure from the essentials of the invention as defined in the claims.

I claim as my invention:

1. The method of moisture-proofing elongated, filled cartons, which consists in enfolded the same in paper wrappers, tightly sealing the folds of the wrapper, then separately immersing the opposite end portions

of each package while sustained by an undipped portion in a bath of melted paraffin, and, immediately after each immersion inverting the package to prevent excess drainage, substantially as described.

2. The method of moisture-proofing elongated, filled, paper cartons, which consists in enfolding the same in paper wrappers, tightly sealing the folds of the wrapper and thereafter separately dipping the opposite end portions of the package in a bath of melted paraffin to weld on substantial protecting coats extending over the end folds, substantially as described.

3. The method of moisture-proofing elongated, filled, paper cartons, which consists in enfolding the same in paper wrappers, tightly sealing the folds of the wrapper and thereafter separately immersing the opposite end portions of the packages in a bath of melted paraffin while the package is held by an undipped portion and thereby maintained in a position slightly inclined to the vertical, substantially as described.

4. The method of moisture-proofing filled, elongated cartons which consists in enfolding the same in paper wrappers, tightly sealing the folds of the wrappers, then, while the package is sustained by an undipped portion in a substantially vertical position, separately immersing the opposite end portions of the package of melted paraffin, and, after each immersion, slowly withdrawing, inverting, and cooling the packages to thereby form slightly overlapping coats on each package, substantially as described.

5. The method of moisture-proofing elongated, filled, paper cartons, which consists in enfolding the package in a paper wrapper, tightly sealing the folds of the wrapper, and then, while the package is held by an undipped portion, separately immersing in melted paraffin, slowly withdrawing and cooling the opposite end portions of the package to form overlapping coats, substantially as described.

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