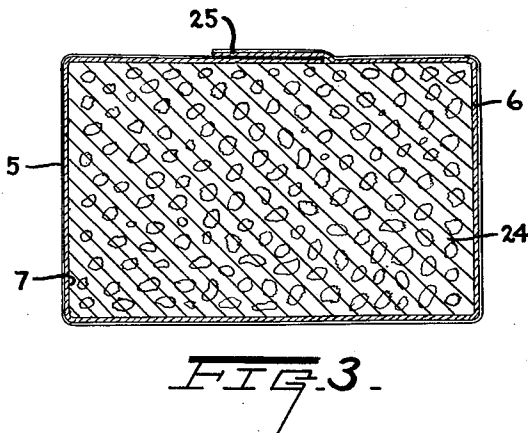
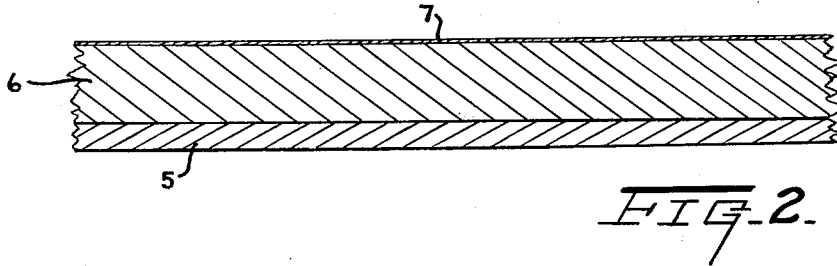
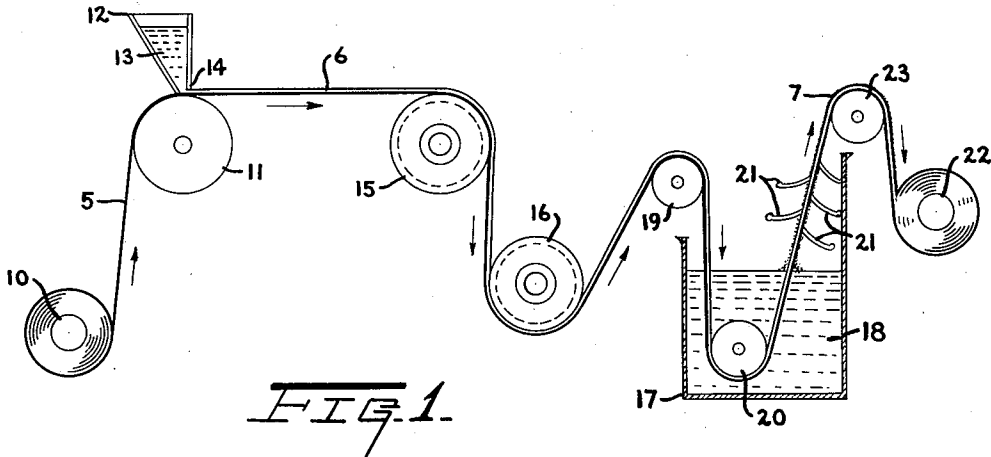


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ART OF PRODUCING WAX-COATED WRAPPERS HAVING  
A SILICONE ANTI-BLOCKING LAYER  
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## ART OF PRODUCING WAX-COATED WRAPPERS HAVING A SILICONE ANTI-BLOCKING LAYER

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The present invention relates generally to improvements in the art of commodity packaging, and relates more particularly to improvements in anti-blocking wrapper sheets for protectively encasing perishable commodities such as cheese or meats and to an improved method of producing such anti-blocking wrappers.

A primary object of this invention is to provide a new and improved highly efficient anti-blocking commodity wrapper and an improved simple and economical method of commercially producing the same.

In the packaging of perishable commodities such as cheese and meats, it is established practice to utilize flexible wrapper sheets formed of regenerated cellulose and other suitable materials provided with thermo-plastic or pressure sensitive coatings of wax or the like adapted to permit simple and convenient hermetic sealing of the wrapper about the encased product by mere application of pressure generally accompanied by heat. Such wax coated wrapper sheets have been found to also provide a final relatively vapor proof package in which the wax coating intimately clings and adheres to the surface of the encased commodity to thereby minimize mold growth or the like.

Despite these advantages however, the tackiness of the thermo-plastic or pressure sensitive coatings of these wrappers presents an extremely serious problem in the handling of the wrapper sheets prior to use; and in efforts to prevent or minimize sticking or so-called blocking of adjacent surfaces of stacks or rolls of the wax coated materials, it has heretofore been necessary common practice to interpose special anti-blocking spacer or slip sheets between the adjacent surfaces thereof. As an alternative means for preventing or minimizing blocking, it has also been heretofore proposed to roughen the outer surface of the wax coating and to apply a separate starch or talc dust coating over the exposed pressure sensitive wrapper surface on the theory that the reduction in surface contact would aid in reducing blocking or sticking of adjacent surfaces of the wrapper stock when stored in stacks or rolls and that the channels thus formed by the roughened surface and/or starch dust coating provides means for permitting objectionable air to escape from within the package during the wrapping operation and customary compression of the wrapper about the commodity.

However, in the utilization of separate spacer sheets for anti-blocking purposes, several definite disadvantages and objections are presented, namely: the cost of the wrappers is increased by approximately ten percent by reason of the anti-blocking spacer sheets which are discarded upon use of the wrappers in the packaging operation; also despite precautionary measures, the spacer or slip sheets sometimes become wrinkled in use and thus results in a similarly wrinkled and untidy final wrapper; oftentimes, the spacer sheets become stuck to the wax or like pressure sensitive coating and thereby results in slow downs in the wrapping or packaging operation as well as an unsightly wrapper in which the adhesive quality is

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somewhat destroyed; and finally, the spacer sheets increase the bulk and result in a soft roll or stack which is difficult to handle and pack. Likewise, the use of a roughened surface and/or dust coating has also proven objectionable for various reasons, namely: except in the packing of hot melted cheese, the coatings heretofore used have quite generally been found to objectionably interfere with and impair the adhesion or cling of the wrapper to the commodity surface in the packing operation, thereby causing voids and fostering mold growth; furthermore, such dust coating and roughened surface frequently interferes with hermetic sealing of the wrapper seams, thus destroying the effectiveness of the pressure sensitive coating; in addition, the roughened wax surfaces and the dust coating presents a rather unattractive appearance and thus causes loss of sales appeal; and finally, commercially practical and economical methods of preparation and application present a serious problem.

It is therefore a more specific object of the present invention to provide an improved heat and/or pressure sealable anti-blocking commodity wrapper adapted to obviate the disadvantages and objections attendant prior wrappers of such general type and which may be readily commercially produced in accordance with an improved method.

Another specific object of the invention is to provide a new and improved method of commercially producing anti-blocking heat and/or pressure sensitive commodity wrappers in a continuous, rapid and economical manner with the aid of simple and inexpensive apparatus.

Another specific object of this invention is to provide an improved anti-blocking commodity wrapper having a pressure sensitive coating covered with a thin smooth protective film providing an effective anti-blocking surface adapted to intimately cling to the surface of a commodity wrapped therein and also adapted to readily heat seal.

Still another specific object of my present invention is to provide improvements in the art of producing anti-blocking commodity wrappers adapted to effectively minimize mold growth in a simple and expeditious manner and which are furthermore adapted to be stored in stacks or rolls for relatively long periods of time without need for spacer sheets.

A further specific object of the present invention is to provide an improved protective commodity wrapper comprising, a relatively durable but flexible base sheet, a continuous layer of pressure sensitive adhesive sealing material adhered to a surface of the base sheet, and a thin continuous film of silicone emulsion superimposed upon the pressure sensitive layer.

An additional specific object of the present invention is to provide an improved and highly efficient and practical method of commercially producing commodity wrappers as hereinabove described.

These and other specific objects and advantages of the invention will be apparent from the following detailed description.

A clear conception of the several steps constituting my improved commodity wrapper production method, and of typical apparatus for performing such steps as well as a typical wrapper produced thereby, may be had by referring to the drawing accompanying and forming a part of this specification wherein like reference characters designate the same or similar parts in the several views.

Fig. 1 is a diagrammatic side view illustrating typical apparatus for performing the several steps of the improved wrapper production method;

Fig. 2 is a greatly enlarged transverse section through a fragment of a wrapper produced in accordance with the improved method; and

Fig. 3 is a transverse section through a cheese batch finally packed within one of the improved wrappers.

While the invention has been shown and described herein as being particularly applicable in the production of anti-blocking protective wrappers formed of wax coated regenerated cellulose and especially adaptable for cheese packaging, it is not desired or intended to unnecessarily restrict or limit the scope or utility thereof by reason of such specific embodiment; and it is also contemplated that certain specific descriptive terms used herein shall be given the broadest possible interpretation consistent with the disclosure.

Referring more particularly to Fig. 1 of the drawing, my improved method of producing anti-blocking wrapper stock comprises, in general, continuously longitudinally advancing a web or base sheet 5 of relatively durable, flexible and moisture-proof sheet material such as regenerated cellulose, adhesively applying a continuous smooth and uniform coating 6 of pressure sensitive or thermoplastic material such as a suitable microcrystalline wax to a surface of the advancing web 5, thereafter cooling the advancing coated web 5 below the freezing point of the pressure sensitive coating 6, then subjecting the advancing coated and cooled web to an abundance of a suitable silicone emulsion as by running the web through a bath of emulsified silicone grease or oil to thereby distribute a quantity of the silicone emulsion over the pressure sensitive coating, subsequently removing or wiping the excessive silicone emulsion from the advancing web 5 and its pressure sensitive coating 6 to thus provide a thin continuous film 7 of the silicone over the entire surface of the pressure sensitive layer 6, and finally either rolling the coated and treated web or severing the same into successive wrapper sheets or sections and stacking such sections for storage or shipment and subsequent use.

The steps of the improved wrapper production method thus described may be conveniently effected by means of relatively simple apparatus of the type diagrammatically illustrated in Fig. 1 of the drawing and comprising, in general, a supply roll 10 from which the web 5 may be continuously withdrawn in a suitable manner and longitudinally advanced over the periphery of a rotatable drum or roller 11; a distributing tank or hopper 12 containing a supply 13 of pressure sensitive or thermo-plastic material such as microcrystalline wax in liquid or fluent state and adapted to constantly feed such fluent pressure sensitive material to a surface of the web 5, the distributor 12 having a scraper 14 or the like associated therewith for smoothly and uniformly spreading the pressure sensitive coating 6 across the entire surface of the web 5; a pair of hollow interiorly cooled rolls 15, 16 disposed in the path of the coated web and respectively coacting with the opposite surfaces thereof to cool the pressure sensitive coating 6 below the freezing point thereof, the rolls 15, 16 being conveniently cooled by constantly supplying cooling liquid therethrough in a well known manner; a tank 17 or the like containing a supply 18 of suitable anti-blocking material or release agent in liquid form and through which the wax coated web may be guided by suitable guide rolls 19, 20 to thereby distribute such anti-blocking agent over the surface of the coating 6; a series of cooperating flexible wiper blades 21 of rubber or the like adapted to coact with both the wax coated and the uncoated sides of the advancing web to remove excessive anti-blocking agent therefrom and to wipe the surfaces smooth by a slight squeezing action, such wiping and squeezing action being insufficient to remove all of the anti-blocking material from the pressure sensitive coating so that a thin continuous film 7 of the anti-blocking material covers the coating 6; and a rewind roll 22 to which the finally treated web may be guided past another guide roll 23.

The wrapping stock thus produced may then be stored or shipped for subsequent use either in the form of a

roll or it may be severed immediately into wrapper sections and stacked for subsequent use; but in either case, no separate spacer or slip sheets are required between convolutions or between wrapper sheets to prevent sticking or blocking of adjacent surfaces. The apparatus for performing the several method steps may, of course, be modified as desired, and the specific materials utilized may also be varied to some extent. For instance, materials other than regenerated cellulose may be used as the base sheet 5, providing that such materials possess the necessary flexibility, mechanical strength, reception and retention of printing, retention of the pressure sensitive coating material to be used, and moisture and vapor proofness. Likewise, in place of microcrystalline wax for the pressure sensitive coating 6, other materials adapted to supply moisture and vapor proofness as well as body to the wrapper and having a relatively low melting point of less than 250° F. so as to result in a somewhat sticky or tacky, relatively soft and pressure sensitive coating may be used; and in this connection, materials falling within the general classification of thermo-plastics and including microcrystalline waxes, paraffins, synthetic resins and blends of such materials modified with rubber, synthetic rubber or wax-gelling materials, and combinations of such materials may be advantageously utilized. With respect to the anti-blocking or release material, it has been found that a silicone emulsion such as methylpolysiloxane or a mixture of such polymers together with a non-toxic emulsifier to carry the silicone in water suspension has proven especially satisfactory; and while a silicone emulsion has been found preferable for this purpose, wetting agents such as polyethylene glycol distearate having a polar group on one half of the molecule and a large nonpolar group on the other end of the molecule, aluminum stearates and calcium stearates, as well as other silicone greases and oils, may be employed. As a specific example, a base sheet available under the trade-name "Cellophane" coated on one side thereof with a relatively heavy layer of modified microcrystalline wax is run through a bath of approximately 2% to 10% silicone emulsion and then squeezed dry on both sides with rubber wiper blades under just sufficient pressure to leave a residual protective layer or film of the emulsified silicone grease or oil superimposed over the wax coating and the uncoated surface of the web, the emulsifier being selected from one having low toxicity so as not to adversely affect food products and a commercially available emulsifier sold by General Electric Company under the identification of SM-55 being typical. It has been found that the thin film of silicone thus deposited on the wrapper surfaces is extremely resistant to sticking or blocking as well as bruising due to the insolubility of the silicone in the wax when cold, but that the minute amount of silicone present in the film is soluble in the wax when heated as in heat and pressure sealing and is thus readily dissolved or dispersed in the wax during the heat sealing operation so as to permit good hermetic sealing of the wrapper in packaging operations.

Referring now more particularly to Figs. 2 and 3 of the drawing, it is apparent that the protective commodity wrapper thus produced comprises, in general, a relatively durable but flexible base sheet 5 of regenerated cellulose or the like, a continuous relatively thick layer or coating 6 of thermo-plastic or pressure sensitive sealing material such as wax covering and adhered to at least one surface of the base sheet 5, and a thin continuous film or layer 7 of emulsified silicone grease or oil superimposed upon and covering at least the thermo-plastic coating 6, and in some cases both the coating 6 and the exposed and uncoated surface of the sheet 5, to thereby provide an anti-blocking protective film. In protectively wrapping a product such as a cheese batch 24 with the improved wrapper, the commodity is snugly embraced by the wrapper with the base sheet 5 providing the exterior of the package and the wax coating 6 disposed adjacent to the

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commodity surface, and the free edges of the wrapper are then overlapped as at 25 and tightly sealed by application of heat and pressure to finally hermetically seal and confine the commodity as shown in Fig. 3.

The improved commodity wrapper production method has proven highly successful and satisfactory in actual use, and the wrappers commercially produced in accordance with the method have completely eliminated the necessity of spacer or slip sheets and have furthermore proven extremely efficient in packaging cheese products and the like. Accordingly, all of the disadvantages and objections heretofore encountered with pressure sensitive wrappers as hereinabove set forth have been obviated by reason of the present invention, and additional advantages have furthermore been achieved.

It should be understood that it is not desired to limit this invention to the exact steps of the improved production method or to the specific materials or precise details of construction of the resultant wrappers herein shown and described, since various modifications within the scope of the appended claims may occur to persons skilled in the art to which this invention pertains.

I claim:

1. The method of producing a protective commodity wrapper, which comprises, advancing a relatively durable but flexible base sheet, applying a continuous coating comprising a microcrystalline wax composition while in plastic condition to a surface of the advancing base sheet, thereafter cooling the advancing web below the freezing point of the wax coating, then totally immersing the advancing coated and cooled sheet in a bath of emulsified

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silicone grease, and finally removing the excess silicone emulsion from the sheet by wiping the same under sufficient resilient pressure applied simultaneously from opposite sides thereof to leave a thin continuous film thereof over at least the exposed surface of the wax coating.

2. The method of producing a protective commodity wrapper, which comprises, advancing a relatively durable but flexible base sheet, applying a continuous coating comprising a microcrystalline wax composition while in plastic condition to a surface of the advancing base sheet, thereafter totally immersing the advancing coated sheet in a bath of emulsified silicone grease, and finally removing the excess silicone emulsion from the sheet by wiping the same under sufficient resilient pressure applied simultaneously from opposite sides thereof to leave a thin continuous film of the emulsion over at least the exposed surface of the wax coating.

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