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WRAPPING MATERIAL FOR MOISTURE-CONTAINING ARTICLE AND METHOD FOR MAKING THE SAME

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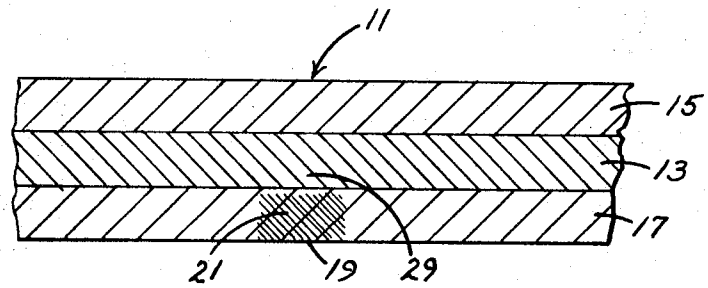


Fig. 1

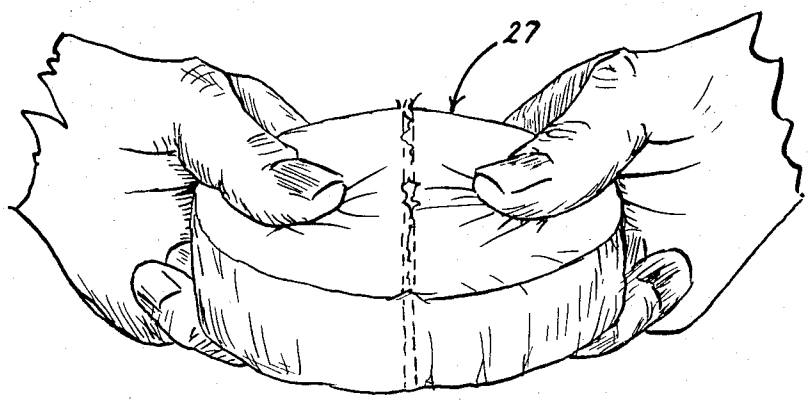


Fig. 3

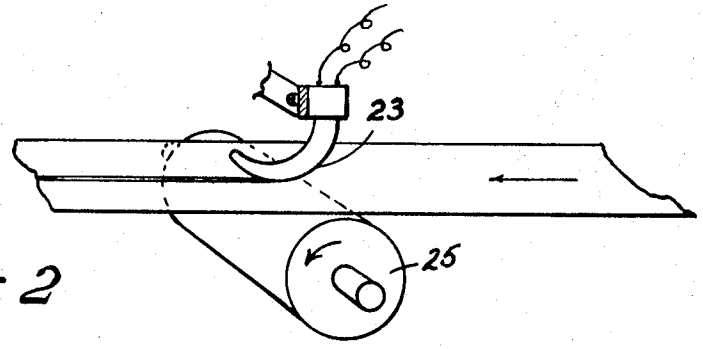


Fig. 2

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WRAPPING MATERIAL FOR MOISTURE-CONTAINING ARTICLE AND METHOD FOR MAKING THE SAME

Joseph T. Sincavage, Knowltonwood, Pa., Carl R. Pepmeier, Fredericksburg, Va., and Louis E. Stoffregen, Springfield, Pa., assignors to FMC Corporation, Philadelphia, Pa.

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U.S. Cl. 117—62 6 Claims

ABSTRACT OF THE DISCLOSURE

A wrapping material for encasing moisture-containing products formed of a non-fibrous, hydrophilic regenerated cellulose sheet having on at least one side thereof a coating of moistureproof material, such as, nitro-cellulose, polyethylene, vinyl copolymers, vinylidene copolymers, with the coated side having a selected area of lower moistureproof properties than the remainder thereof whereby the portion of the regenerated cellulose sheet adjacent to such selected area of a coated side is more receptive to moisture and thus more frangible than the remainder thereof.

The present invention is directed to an improved wrapping material for encasing moisture-containing products and a method of making the same.

A wrapping material consisting of a non-fibrous, hydrophilic regenerated cellulose sheet which is coated on one or both sides with a moistureproof material is commonly employed in the packaging of a variety of moisture-containing products. As an example, preshaped masses of fresh ground meat are often packaged in a non-fibrous, hydrophilic regenerated cellulose sheet having a coating of thermoplastic, moistureproof material on both of its sides. The moistureproof coating on the inside of such package minimizes the escape of moisture from the packaged ground meat, while the outer or exposed moistureproof coating serves primarily to prevent loss or addition of moisture to the regenerated cellulose sheet by ambient atmosphere.

Desirably, access to such packaged meat product, or other like moisture-containing articles, should be made as easily as possible and preferably by having the wrapping material rupture under tension, as by the user merely bending the package upon itself by hand. The presence of the coatings of moistureproof material on the regenerated cellulose sheet, however, provides the wrapping material with such strength or toughness that package rupture in the preferred manner cannot be easily achieved.

Packages having a wrapping material as described above, can be made to open more easily by the application of separate tear strips. This procedure, however, involves added costs and often complicates the operation of the wrapping of moisture-containing articles. Another approach has been to perforate the wrapping material along a line of desired rupture. The presence of even a small number of openings in the wrapping material does involve at least a localized loss of moisture from the packaged product and may permit the entry of foreign material into the package itself. Therefore, wide acceptance of this approach has not been received. Accordingly, a primary object of this invention is to provide a generally new or improved and more satisfactory wrapping material for encasing moisture-containing products and a method of making the same.

Another object is the provision of a wrapping material of moistureproof, non-fibrous, hydrophilic regenerated

cellulose for use with moisture-containing products which is capable of rupturing along a predetermined area.

Still another object is the provision of a wrapping material formed of moistureproof, non-fibrous, hydrophilic regenerated cellulose having a selected area which is more sensitive and frangible than the remaining areas thereof.

A further object is the provision of an imperforate, moistureproof wrapping material, and method of makng the same, consisting of a non-fibrous hydrophilic regenerated cellulose sheet and a moistureproof coating thereon in which a portion of the regenerated cellulose sheet is rendered more receptive to moisture than the remainder thereof.

A still further object is to provide a method of lowering the moistureproof properties along only a selected area of a wrapping material formed of a non-fibrous, hydrophilic regenerated cellulose sheet having a continuous coating of moistureproof material thereon.

These objects are accomplished in accordance with the present invention by a wrapping material for use with moisture-containing products formed of a non-fibrous, hydrophilic regenerated cellulose sheet having, at least along one side thereof, a coating of moistureproof material in which the moistureproof properties along a selected area thereof are lower than the remainder of such coating. Preferably, the selected area of the wrapping material coating is moistureproof to some degree and, desirably, is continuous, narrow in width and extends lineally across the wrapping material.

The wrapping material of the present invention is formed by heating a selected area of a coated side of a conventional wrapping material formed of non-fibrous, hydrophilic regenerated cellulose having a dry moistureproof, and, desirably, thermoplastic, coating on at least one and preferably both sides thereof. The applied heat must be sufficient to at least reduce the moistureproof properties of the coating material along the selected area of only one of the coated sides of the wrapping material and is such as to heat such coating material to at least its softening temperature. The moistureproof properties along the selected area of the coated side of the wrapping material may be reduced throughout the thickness thereof but are preferably lowered through only a portion of such coating.

In a package formed by encasing the wrapping material of the present invention about a moisture-containing product, with the selected area of the coated side thereof exposed to the product itself, the user needs only to bend the package by hand to thereby tension and cause rupture of the wrapping material along the selected area thereof.

While the manner of heat application to the selected area of the coated side of the wrapping material may, in some instances, cause a slight reduction in the coating thickness along such area, the thickness reduction itself is negligible and has no apparent effect upon the rupture characteristics of the wrapping material. It is believed that by reducing the moistureproof properties along a selected area of the wrapping material coating, moisture from a packaged moisture-containing product can more readily penetrate into the portion of the regenerated cellulose sheet which is adjacent to such selected area. As is generally known, moistening of a dry non-fibrous, hydrophilic regenerated cellulose sheet or film increases its ability to elongate while reducing its tensile strength. Thus, in the wrapping material of the present invention the portion of the regenerated cellulose sheet which is adjacent to the treated area of the coating is most receptive to moisture and is therefore the weakest and most easily ruptured when the wrapping material is tensioned.

The penetration of moisture through the selected area of the coated side of the wrapping material and into the regenerated cellulose sheet is slow and involves only

a negligible loss from the packaged product. Preferably, the wrapping material of the present invention includes moistureproof coatings on each of the sides of the regenerated cellulose sheet, but with only one of such coatings being treated to lower the moistureproof properties along a selected area thereof. The remaining of such coatings would thus serve to minimize escape of moisture from the packaged product as well as avoid loss or the addition of moisture to the regenerated cellulose sheet from the ambient atmosphere.

As heretofore mentioned, the moistureproof coating which is treated along a selected area thereof is also thermoplastic and thus heat-sealable to itself. The moistureproof coatings on opposite sides of the regenerated collulose sheet need not be like materials and may include coating materials, such as nitro-cellulose, polyethylene, vinyl copolymers, vinylidene copolymers (saran) etc.

In the drawing, FIG. 1 is a vertical section, on the enlarged scale, through a portion of the wrapping material of the present invention;

FIG. 2 is a diagrammatic view illustrating a method of providing a coated side of a wrapping material with lower moistureproof properties along a selected area thereof; and

FIG. 3 is a diagrammatic view illustrating a package using the wrapping material of the present invention and the manner of opening the same.

Illustrated in FIG. 1 of the drawing is the wrapping material **11** of the present invention which includes a sheet or film **13** of non-fibrous, hydrophilic regenerated cellulose having on opposite sides thereof coatings **15** and **17** of thermoplastic, moistureproof material, as for example of polyethylene. Along a selected area **19** the moistureproof properties of the coatings **17** are lowered, as by the application of heat as hereafter described. This lowering or reduction of the moistureproof properties along the area **19** of the coating **17** may extend through the entire coating thickness. Preferably, and as indicated by shading **21**, the moistureproof properties along the area **19** are merely altered through a portion of the thickness of the coating **17** so that an undisturbed portion thereof remains adjacent to the regenerated cellulose sheet **13**.

The method of the present invention is rather simple and, as shown in FIG. 2, merely involves passing between a heated metal finger **23** and back-up roller **25** a conventional wrapping material consisting of a regenerated cellulose sheet or film **13** having a bottom and top coating **15** and **17**, respectively, of thermoplastic, moistureproof material. The finger **23** is maintained heated by suitable electrical means to a temperature sufficient to heat the selected area **19** of the coating **17** to at least the softening temperature of the coating material. The temperature of the finger **23** itself will therefore vary with such factors as the speed of travel of the wrapping material relative to the heated finger, the area of contact between the finger and wrapping material, the pressure of the finger on the coating **17**, the degree of heat penetration desired, etc. The back-up roller **25** has a hard peripheral surface and preferably is made of metal. The metal finger **23** may be formed, for example of wire or resilient plate and would exert little pressure on the coating being treated. In lieu of the finger **23**, heating of the coating **17** may also be achieved by the use of a heated rotatable disk, a jet of hot gas, etc.

As a result of the heat application as described above, the coating **17** along the selected area **19** undergoes physical or structural modification, with the normally clear or transparent coating material assuming a translucent appearance. Any reduction in the thickness of the coating **17** which may be occasioned along the area is negligible and appears to have no significant effect in determining the path of rupture of the wrapping material when it is tensioned. For example, merely reducing the

thickness of the wrapping material in a selected area by an amount as might be occasioned during the heat application by the finger **23**, neither provides for a wrapping material which is significantly more frangible nor a means for confining rupture of the wrapping material along a desired path.

It is perhaps possible that chemical changes accompany the above-mentioned physical or structural modification in the coating **17** along the heated area **19**. What is important in the present invention is that the heated area **19** of the coating **17** exhibits lower moistureproof properties than the remainder of such coating. Thus, while the present invention is not predicated upon any specific theory, it is believed that the structural modification or disruption of the coating **17** along the treated area **19** facilitates moisture penetration therethrough.

In packaging of a moisture-containing product or article, such as fresh ground meat, with the wrapping material of the present invention, its coated side **17**, and particularly the treated area **19** thereof, is exposed to or placed in contact with the product being packaged. With the wrapping material encased about the product and sealed, as by heat, to provide a package as shown at **27** in FIG. 3, the product itself is fully protected against moisture loss or gain as well as against the entry of foreign matter. However, moisture from the encased product can and does slowly penetrate through the treated area **19** of the coating **17** and enters into the portion **29** of the regenerated cellulose sheet **13** which is adjacent thereto. The treated area **19** of the coating is generally narrow in width so that the passage of only a very small amount of moisture is occasioned therethrough.

Once such moisture is assumed by the portion **29** of the regenerated cellulose film **13** adjacent to the treated area **19** of the coating **17**, such film portion **29** possesses greater elongation but lower tensile strength than the remainder of such film. Thus, the portion **29** of the regenerated cellulose **13**, being the weakest area, will be the first to rupture when tensioned, as by bending of the package **27** as shown in FIG. 3.

As heretofore mentioned, the selected area **19** of the coated side **17** of the wrapping material is preferably made as narrow as is necessary for achieving the desired moisture passage therethrough. Such treated area preferably extends continuously and lineally across the wrapping material to insure stresses within the wrapping material concentrate in the desired area where such wrapping material is tensioned.

It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

We claim:

1. A wrapping material which is frangible along a predetermined area thereof for use in encasing moisture containing products including a sheet of non-fibrous, hydrophilic regenerated cellulose having on at least one side thereof, a continuous coating selected from the group consisting of nitro-cellulose, polyethylene, vinyl copolymers and vinylidene copolymers, the coated side of the wrapping material having lower moistureproof properties at a selected area of said coating than along the remainder thereof whereby the portion of the regenerated cellulose sheet at such selected area is more receptive to moisture and more easily ruptured than the remainder thereof.

2. A wrapping material as defined in claim **1** wherein the selected area of said coating having lower moistureproof properties is elongated and narrow in width.

3. A wrapping material as defined in claim **2** wherein the selected area is located between the longitudinal edges of the wrapping material and extends continuously along the length thereof.

4. A wrapping material as defined in claim **1** wherein both sides of the regenerated cellulose sheet are coated with moistureproof material and only one of such coated

sides has a selected area having lower moistureproof properties.

5. A method of making a wrapping material which is frangible along a predetermined area thereof for use in encasing moisture-containing products including coating at least one side of non-fibrous, hydrophilic regenerated cellulose sheet with a thermoplastic, moistureproof material selected from the group consisting of nitro-cellulose, polyethylene, vinyl copolymers, and vinylidene copolymers, heating a selected area of the dry coated side of the wrapping material through at least a portion of the thickness of the coating material to above its softening temperature to thereby lower the moistureproof properties along such selected areas and thereafter cooling the portion of the coating material which has been heated.

6. A method as defined in claim **5** wherein said selected area of the coated side of the wrapping material is elongated, narrow in width and extends continuously along the wrapping material and wherein the coating material along the selected area is heated to a depth less than the thickness thereof.

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WILLIAM D. MARTIN, Primary Examiner

M. R. LUSIGNAN, Assistant Examiner

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