Sept. 12, 1972 A. McINTOSH VESSIE 3,690,923

FROZEN FISH PACKAGE

Filed Feb. 12, 1970 2 Sheets-Sheet 1

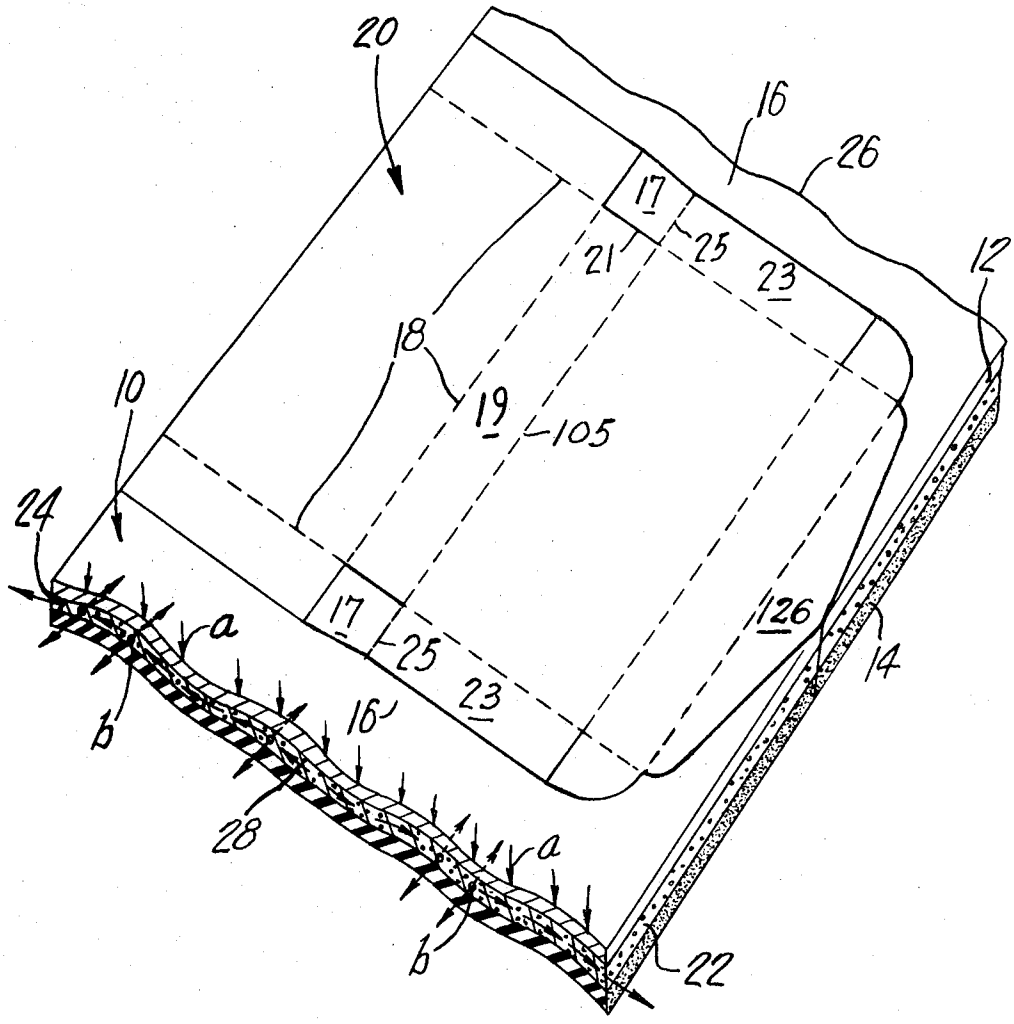


FIG. 1

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FROZEN FISH PACKAGE

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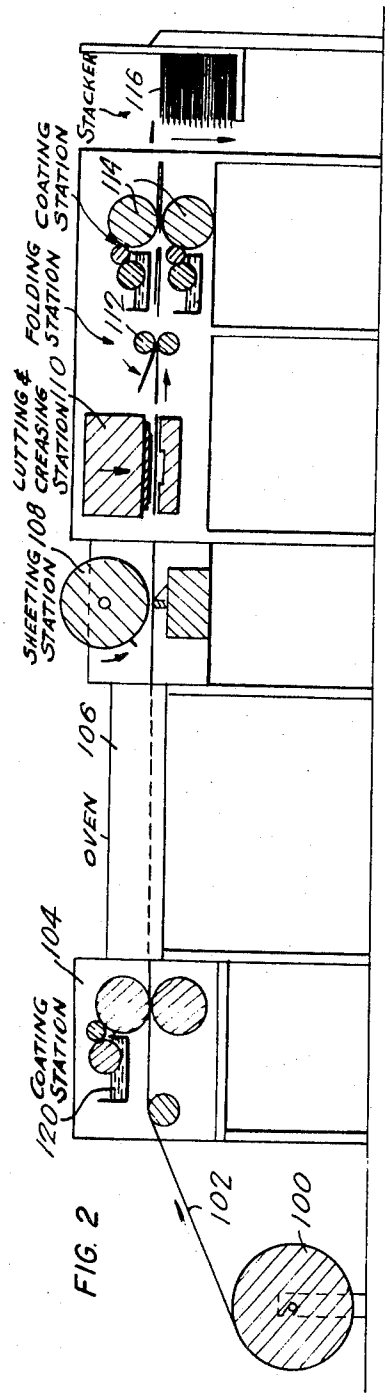


FIG. 2

FIG. 3

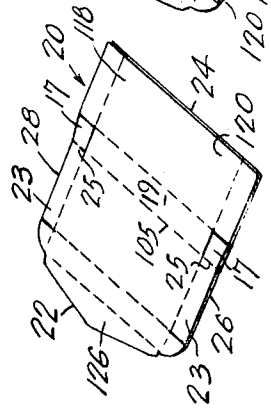


FIG. 4

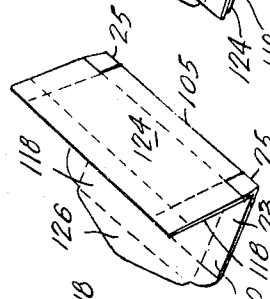


FIG. 5

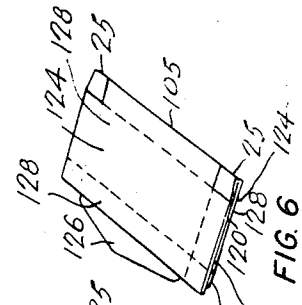


FIG. 6

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FROZEN FISH PACKAGE

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Int. Cl. B05c 9/04; C09d 5/00
U.S. Cl. 117—68 9 Claims

ABSTRACT OF THE DISCLOSURE

A packaging folder formed from a fibrous board having a porosity in the range of 300 to 650 seconds measured on a Gurley densometer and coated on one surface with a release coating permeable to air but substantially preventing penetration of water into the board and preferably coated on the other surface with a wax coating impervious to water and water vapour.

FIELD OF THE INVENTION

The present invention relates to material for packaging. More specifically, the present invention relates to material for packaging frozen foods under pressure while permitting the escape of air and substantially preventing adhesion of the product being packaged to the packaging material.

DESCRIPTION OF PRIOR ART

There have been prior proposals to provide packaging material and packages specifically for frozen fish and wherein air squeezed from the fish during the packaging operation is permitted to escape through the material or package. One commercially acceptable material is a coated board having a plurality of spaced depressions on its surface and into which the air from the fish is squeezed. While this type of board or package satisfactorily eliminates the air from the fish during freezer press compression, it has inherent disadvantages particularly allowing the passage of moisture from the product during freezer storage resulting in dehydration of the product.

SUMMARY OF INVENTION

It is thus the object of the present invention to provide an improved material for packaging compressed frozen foods.

Broadly, the present invention relates to a packaging board comprising a fibrous board coated with a releasing agent to prevent sticking of the frozen product to the board. The board has a porosity in the range of 300 to 650 seconds measured on the Gurley densometer. One surface of the fibrous board is treated with a release agent to coat the fibers thereof whereby the surface remains permeable to air, but substantially impermeable to water. Preferably, the board is highly sized and the surface of the board facing the product to be packaged may be sized to a greater degree than the remainder of the board. A moisture and water impervious wax coating is applied to the other surface of the board to act as a barrier to retain the moisture in the frozen fish in freezer storage.

BRIEF DESCRIPTION OF DRAWINGS

Further features, objects and advantages will be evident from the following detailed description of a preferred embodiment of the present invention taken in conjunction with the accompanying drawings in which:

FIG. 1 is an isometric view of the board embodying one form of the present invention;

FIG. 2 is an elevation schematically illustrating one form of a system for coating of the board;

FIG. 3 is an isometric view of the web as it is being sheeted in the sheeter of FIG. 2;

FIG. 4 is an isometric view of the cut and creased blank after forming in the cutting and creasing station;

FIG. 5 is an isometric view of the blank as it is being folded in the folding station;

FIG. 6 is an isometric view of the folded and coated blank delivered from the final coating station and coated on both sides.

DESCRIPTION OF PREFERRED EMBODIMENTS

As illustrated in the drawings, the board **10** is coated on one side with a coating **12** that covers the surface of the fibers adjacent the surface of the board, but leaves the interstices between the fibers substantially free so that air may penetrate into the board between adjacent fibers. The opposite surface of the board in the illustrated embodiment is provided with a substantailly water vapour impervious barrier coating **14**.

The board **10** may be cut and creased in any suitable manner to provide the required blank. However, when coating in accordance with one of the preferred methods of the present invention, it is preferred to form the blank in a very specific manner as illustrated at **20** in FIG. 1. This blank **20** has the conventional cut lines represented by solid lines and crease lines represented by dash lines and indicated at **16** and **18** respectively. However, the two flaps **17** adjacent the back panel **19** are not directly connected to the back panel as is normally the case but instead are separated therefrom by lines of severance **21** and are connected to side flaps **23** by crease lines **25**.

The board **10** is preferably highly sized to provide the required degree of wet strength commensurate with the amount of water vapour penetrating the coating **12** with the air squeezed from the product being packaged and frozen. Preferably, the size used is a rosin size and the degree of sizing to at least a reading of about 30 grams per square meter for two minutes based on the Cobb test and preferably 26 to 24 grams per square meter. It has been found that this degree of sizing permits the board to maintain the required degree of wet strength when coated as described hereinbelow under conditions found in the packaging of frozen fish.

The porosity of the uncoated board **10** is of prime importance. This must be in the range of 300 to 650 seconds measured on the Gurley densometer and preferably will be in the range of 525 to 625 seconds. If the density is less than 300 seconds, it has been found to be substantially impossible to prevent the product from sticking to the board regardless of the amount of coating applied, when using the specific coating described hereinbelow. When the density is above 650 seconds, the board is not sufficiently porous to permit the required rate of penetration of air into the board from the product being compressed and an inferior airpocketed product is produced. As indicated above, best results are obtained when the uncoated board has a porosity in the range of 525 to 625 seconds measured on the Gurley densometer.

The thickness of the board should be at least .02 inches, i.e. above about 20 point to provide the required strength characteristics to provide the required space to absorb the air displaced from the material being packaged and permit same to travel laterally and be dispensed at the side edges of the board. Thicker boards have a greater capacity to absorb air and are better from that point of view, however, they are more expensive and a balance is, therefore maintained to provide the most economical board for the specific purpose.

The board **10** is coated with a suitable release coating **12** to prevent sticking of the product. It has been found that a silicone coating is very satisfactory for this purpose. One suitable release coating and the one preferred for the

present invention contains a polysilozane and catalyst and preferably also will contain a sizing agent. The polysilozane is an organic polysilozane sold under the registered trademark "Syl-Off" by Dow Corning Corporation, Midland, Mich. This product contains organo-polysilozane and has a pH of 6.5 and a specific gravity at 77° F. of 1. The catalyst is a metal organic salt sold under the trade name "EY–142" also by Dow Corning. The preferred sizing agent is a zirconium-wax complex sold under the registered trademark "Sunsize FH" by Sun Chemical Corporation, 631 Central Ave., Carlstadt, N.J.

One specific coating incorporating a sizing agent is a water solution containing about 15% by volume of Syl-Off 26, 10% by volume of Sunsize and 1% by volume of EY–142. This solution is used in the range of about 1 to 3 pounds of silicone solids for three thousand square feet, preferably about 1.5 pounds of silicone solids for three thousand square feet with a board having a Cobb test reading of 24 to 26 grams per square meter for two minutes and a porosity of 525 to 625 seconds on the Gurley desometer before coating to provide a product having a Cobb test reading of 12 to 15 grams per square meter and a porosity of 450 to 550 seconds on the Gurley densometer after coating.

The coating **12** may be applied in any suitable manner, for example by a conventional roll type coater or the like wherein measured quantities of coating may be uniformly applied to the board. As above indicated, the pick-up will generally be about 1.5 pounds of silicone per three thousand square feet of board. After coating, the coated board is cured preferably by passing same through an oven held at a temperature of above about 375° F. by means of infrared heaters and hot air. The length of the oven will depend on the temperature and speed of passage. However, complete curing of the silicone coating may not be necessary if the boards are wound into rolls and retain the heat whereby curing can be completed during storage.

After the board has been coated, the porosity increases to bring the Gurley densometer reading down to the range of 450 to 550 seconds. In addition, the Cobb test changes to 12 to 15 grams per square meter for two minutes due to the added size incorporated with the coating and concentrated on the surface of the board facing the product. This added size is very important as it prevents moisture penetration into the board and the formation of ice needles which would tend to bond the product being packaged to the board and prevent proper separation.

The sizing and release effect may be achieved by applying the size and release coating in several ways.

As indicated above, the release coating may be applied to a board sized to a Cobb reading below about 30 grams per square meter and the release coating incorporate the further size required to reduce the Cobb reading to the range of 12 to 15 grams per square meter. Alternatively, the board may be pre-sized to a lower reading on the Cobb test and less size be incorporated with the release coating. In some cases, the size content of the release coating may be reduced to a minimum to facilitate application of the coating to the material. In any event, it is preferred to have the resultant packaging board with a Cobb reading in the range of 12 to 15 grams per square meter.

The impervious coating **14** is not a necessity but it will normally be applied. Generally, some form of coating at least must be provided to prevent sticking of the package to the press platens. As above described, current folder packages permit a degree of escape of moisture from the frozen fish during freezer storage or transporation resulting in deterioration of fish quality.

To overcome this, folder packaged fish blocks are normally inserted into impervious polyethylene bags. The substantially impervious coating **14** of wax or the like provides a seal which prevents escape of moisture through the board and thereby, in some cases, making the use of polyethylene bags unnecessary.

In operation, a blank may be formed from the board in the present invention and the material to be packaged placed into a container formed from said blank and pressed and frozen. Air pressed from the material being packaged travels, as indicated by the arrows *a* and *b*, through the surface of the board and then along the board and out at the side edges **22** and **24** or end edges **26** and **28**. In FIG. 1, these edges are shown spaced from the edge of the blank however, obviously, in operation, the edges will be the edges of the blank itself as indicated in FIG. 4. The amount of air leaving the board at the edges **22, 24, 26** and **28** need not be equal to the amount of air squeezed from the product being packaged if there is sufficient volume within the board itself to absorb this air without building up sufficient pressure to expel the air.

Referring to FIGS. 2 to 5 inclusive, the preferred method of coating will be described. The roll **100** of board is unrolled and the web **102** fed through a coating station **104** wherein the release coating is applied and then into and through an oven **106** wherein the release coating is cured. Next, the board is sheeted in sheeting station **108** and blanks **20** are then formed from the sheet web by cutting and creasing in the cutting and creasing station **110** and foldel along crease lines **105** and **25** (see FIGS. 1 and 5) in the folding station **112** and finally the folded blank is coated on the outwardly exposed upward and downward facing surfaces of the folded blank in a second coating station **114** and are stacked in stacker **116**.

In the coating station **104** the web **102** is coated on its upper surface **118** with a suitable coating **120**. This coating is cured in the oven **106** and the web is sheeted into individual sheets **122** (see FIG. 3) in the sheeting station **110**.

The individual sheets **122** are then fed to the cutting and creasing station **108** where the blank **20** is cut and creased as shown in FIGS. 1 and 4.

After the blank has been formed, it is moved into a folding station schematically indicated at **112** in FIG. 2 and is folded along the fold line **105** and its extensions **25** so that the inner surface **118** having the coating **120** is in face-to-face relationship with itself as shown in FIG. 6. After the blank **20** has been folded as described, it is ready for passage through the second coating station **114** where the outer coating is applied to the outer exposed surfaces **124** of the blank.

The fold on crease line **105** and its extensions **25** forms the leading end of the blank as the blank moves through the coating station **114**. This fold substantially prevents the penetration of coating material into the leading edge and onto the inner surface of the side flaps **23**, thereby protecting the inner previously coated surfaces **18** of the blank from being coated with coating applied in coating station **114**.

A locking flap **126** extends from the bottom portion of the folded blank rearward of the edge **128** of the top portion. This locking flap is thus exposed on both surfaces as it traverses the coating station **114** and is therefore coated on both sides. Coating of the flap **126** on both sides tends to further rigidify same.

As indicated, the outer surfaces **124**, which in effect is the bottom surface of the web **102** being withdrawn from the roll **100**, is thus completely coated with a coating **128**.

In some cases, it may be desirable to cut and score the web **102** prior to the coating station **104** so that the release coating is applied only to the blank **20**, not to the material on the web surrounding the blank. In this case, a separate blanking station will precede the coating station **104**.

Modifications may be made without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A packaging board comprising a sized fibrous board having an uncoated porosity of 300–650 seconds measured on a Gurley densometer, one surface of said fibrous

board being a surface treated with a release agent to coat only the fibers thereof whereby said surface remains permeable to air through the interstices between fibers, and said surface is rendered substantially impermeable to water and the second surface of said fibrous board being coated with a continuous film substantially impermeable to both water and water vapour.

2. A board as defined in claim 1, wherein said fibrous board has a good wet strength to resist softening due to water vapour penetrating the board with air.

3. A board as defined in claim 2, wherein said uncoated fiber board has one surface sized to a maximum reading of 30 grams per square meter for two minutes on the Cobb test before said one surface is treated with said release agent.

4. A board as defined in claim 3, wherein said one surface has a Cobb test reading of 12–15 grams per square meter for two minutes after treatment with a release agent.

5. A board as defined in claim 4, wherein said release agent is a silicone polymer.

6. A board as defined in claim 5, wherein said release agent is an organo polysiloxane.

7. A board as defined in claim 5, wherein said release agent contains a sizing agent.

8. A board as defined in claim 7, wherein said board is sized to 24–26 grams per square meter for two minutes as read on the Cobb test before coating and 12–15 grams per square meter for two minutes on the Cobb test after coating.

9. A packaging board as defined in claim 5, wherein an impervious wax coating covers the side of said board opposite said coating having the release agent.

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117—685, 135.5, 161 ZA, 168