

Wrapper for Soap Bar

Field of the invention

- 5 The invention relates to wrappers for bars of soap or like articles.

Background of the invention

10 Soap bars are generally packaged in paperboard cartons and paper composites (laminated sheet material) usually along with a paperboard stiffener. The paperboard generally has a barrier layer of plastic. The carton provides a rectangular shape for stacking and protects the soap bar until use. The wrapper and stiffener combination provide a cost effective alternative to cartons.

15 A paper composite is made of a layer of paper along with one or more layers of a plastic material. The paper component provides stiff substrate to and add strength and also provides a surface for sealant deposition. The plastic film provides decoration features and moisture and fragrance barrier properties. The wrapper is the most common form of package for soap bars.

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Bars of soap are used across the world. They are available in various shapes although the sizes are more or less standardized excepting for the differences in grammage. Rectangular or saddle shaped bars are the most common as they are easy to grip and use.

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A typical bar of soap is packaged in the envelope-wrapped format. First, a bar is placed on a rectangular sheet of wrapper material and then a stiffener, usually a thick sheet of paper, is placed over the bar so as to surround the bar along the longitudinal extent while leaving the shorter ends of the bar open. Thereafter, the two overlapping long
30 edges of the sheet are lap-sealed. Then the shorter edges of the sheet are sealed by an envelope seal on either side. This completes the wrapping operation.

It is generally observed that usually the entire surface of the paper side of the wrapper is coated with an adhesive for sealability and operational convenience. Heat sealable

adhesives are more common. The adhesive is usually applied at an average grammage of 12 to 15 g/m². However, much of the adhesive is not utilised for adhesion or sealing. However, such a practice has been carried on for decades because it is believed that it is convenient to coat the entire surface of the wrapper.

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US4877674A (Milprint Inc, 1989) discloses a single piece non-wrinkling wrapper for bars of soap which is made from a lamina of sheets of a flexible plastic film and a water absorbent paper. The film and paper are superimposed and bonded together along their margins by continuous bands of adhesive. The exposed surface of the paper
10 sheet is coated with a cold seal cohesive along the margins in register with the adhesive bands. When wrapped around a bar of soap, the cohesive and adhesive fall in the back seal and end seal areas of the soap, thereby double wrapping the bar with the film and paper sheets and with an air space between the sheets which prevents or minimizes the wrinkling of the outer wrap. This publication discloses the overlapped
15 margins being united by continuous bands of adhesive. The method is slightly better than the conventional process.

WO/1996/037418 (HIGHLAND SUPPLY CORPORATION) discloses a wrapping material having a bonding material disposed on either an upper surface or a lower
20 surface. The document however discloses wrappers which are stacked on top of each other with the help of adhesive such that each wrapping sheet is bondingly and releasably connects to one other sheet of wrapping material to form the pad whereby one of the sheets of material can be releasably disconnected from another sheet of material by pulling the sheets of material apart. This pad of plurality of wrappers
25 stacked on top of each other and bondingly and releasably connected to each other are better suited for manual and small scale packaging. The disclosure also explicitly states that the present invention is adapted to be used in connection with a food preparation center (not shown) such as a McDonald's® or a Wendy's® type of restaurant or other restaurant where food is prepared for consumption at the center or
30 for take-away by the customer for consumption at a location remote from the center. However, this method is not suited for a mass scale production of wrapper for soap bars.

The soap bars as a product is something which is usually produced and packaged on a mass scale in the factory by specially designed machines which package the soaps at speeds as high as 180 to 550 Units per minute, i.e., soaps per minute. Therefore there is a need to have soap wrappers in sheet form which are severable into plurality of
5 discrete wrappers which are fit to be fed in the modern day automated soap packaging/wrapping machines for speedy packaging.

EP1340690 (SONY CORP) relates to a packing material used for wrapping an article to be packed and sealing and packing the article to be packed by heat-sealing mutually
10 superposed end parts. The packing material is composed of a biodegradable film. Heat sealing agent layers are selectively provided in the heat sealing positions or the heat-sealed parts of the biodegradable film. The heat sealing agent layers are provided on the front surface and the back surface, the front surface and the front surface, or the back surface and the back surface of the mutually superposed biodegradable film when
15 the article to be packed is packed.

In US2006201115 A1 (Colgate Palmolive) is disclosed a wrapper which has some features of a carton pack. A single sheet of material is die-cut to form a main section with the top, bottom and longitudinal side panels and end flaps appended to each
20 panel. In order to promote folding at the desired points the sheet of material is weakened by scoring, perforating or scoring at the fold points. Heat-sealable adhesive is applied to the flaps and the overlapping edges.

Therefore, in view of the shortcomings of the prior art, there is an unmet need for more
25 sustainable and robust wrappers for soap bars.

Summary of the invention

In accordance with a first aspect is disclosed a sheet of laminate comprising a paper
30 component laminated to a plastic component, said sheet comprising, and severable into, plurality of discrete wrappers, each comprising opposed first and second edges and opposed third and fourth edges wherein the paper component of each wrapper comprises:

- (i) a first adhesive-coated portion located along substantially the entire length of said first edge;
- (ii) a second adhesive-coated portion located between said first and second edges and along a part of the length of said third edge; and,
- 5 (iii) a third adhesive-coated portion located opposite said second portion along a part of the length of said fourth edge.

In accordance with a second aspect is disclosed a wrapper for soap bar, the wrapper comprising a paper component laminated to a plastic component, and opposed first
10 and second edges and opposed third and fourth edges, wherein the paper component of each wrapper comprises:

- (i) a first adhesive-coated portion located along substantially the entire length of said first edge;
- (ii) a second adhesive-coated portion located between said first and second edges
15 and along a part of the length of said third edge; and,
- (iii) a third adhesive-coated portion located opposite said second portion along a part of the length of said fourth edge.

The invention will now be explained in detail.

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Brief description of the figures

Fig.1 is a plan view of a preferred embodiment of a wrapper.

- 25 Fig.2 is an isometric view of another preferred embodiment of a wrapper being used for completion of wrapping of a bar of soap.

Detailed description of the figures

- 30 Fig.1 is a plan view of a preferred embodiment of a wrapper as seen from the paper component side. Seen in this view is a rectangular wrapper having four edges, a first edge (1), an opposed second edge (2), a third edge (3) and opposed thereto a fourth edge (4). An imaginary line (5) between the first (1) and second edge (2) divides the wrapper into two equal halves. There is a first adhesive-coated portion (6) located along

substantially the entire length of the first edge (1). The second adhesive-coated portion (7) is located between the first and second edges and along a part of the length of the third edge (3). The third adhesive-coated portion (8) is located opposite the second portion (7) along a part of the length of the fourth edge (4). Each adhesive-coated

5 portion has coating of knurled pattern as seen in the figure. Width of the second adhesive-coated portion (7) is about 16% of the total width of the wrapper as defined by the third (3) and fourth edge (4). So also, width of the third adhesive-coated portion (8) is about 16% of the total width of the wrapper as defined by the third (3) and fourth edge (4).

10 The second and third adhesive-coated portions (7 and 8) are each located about an imaginary line (5) between the first (1) and second edge (2) which divides the wrapper into two equal halves, with a major part of the second (7) and the third adhesive-coated portion (8) lying in the half towards the second edge (2).

15 Width of the first adhesive-coated portion (6) is 14% of the total length of the wrapper as defined by the first (1) and second edge (2).

In Fig.2 is shown an isometric view of another preferred embodiment of a wrapper

20 being used for completion of wrapping of a bar of soap (shown without a stiffener). The bar of soap (9) is placed on the wrapper as shown in the figure. Edges (1) and (2) are folded over the bar (9) for lap-seal. The third adhesive-coated portion (8) is meant to be used for envelope sealing. In a similar manner, the second adhesive coated portion (7, which is not seen in this view) is meant for the other envelope seal.

25 Detailed description of the invention

In accordance with a first aspect is disclosed a sheet of laminate comprising a paper component laminated to a plastic component, said sheet comprising, and severable

30 into plurality of discrete wrappers each comprising opposed first and second edges and opposed third and fourth edges, wherein the paper component of each wrapper comprises:

- (i) a first adhesive-coated portion located along substantially the entire length of said first edge;

- (ii) a second adhesive-coated portion located between said first and second edges and along a part of the length of said third edge; and,
- (iii) a third adhesive-coated portion located opposite said second portion along a part of the length of said fourth edge.

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Usually a sheet of laminate is made on continuous basis from a pair of webs (paper component and plastic component) which are brought into facing contact with each other. Before the individual webs are brought together, the longitudinal margins of at least one web are coated with an adhesive and longitudinally spaced transverse bands of adhesive are also applied to the web. Hot melt or any other suitable adhesive is then applied to the paper side of the laminate, which, as described earlier, is conventionally applied across the length and breadth of the paper side of the laminate. The sheet is then wound and moved to a station where it is unwound for use as packaging material.

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After unwinding, the sheet material is severed longitudinally and transversely into the discrete unit-size wrappers for individual bars or like articles. The sheet is especially useful for advanced automated machines that pack the soap bars at speeds as high as 180 to 550 Units per minute, i.e., soaps per minute. The sheets are mostly fed into the machines as rolls and therefore it is important that adhesive or the sealing material is activated only at the time of packaging by an activator such as heat or pressure. If the sealing agent or the adhesive is active under all conditions then it will be difficult to feed such sheets in a roll form in the soap packaging machines.

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Paper density (better known as grammage) is a term used in the pulp and paper industry to denote a measure of mass of the product per unit of area for a type of paper or paperboard. The grammage is usually expressed in terms of grams per square meter (g/m^2). It is preferred that grammage of the paper component is 30 to 75 g/m^2 , more preferably 40 to 70 g/m^2 .

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The paper component is preferably selected from poster, chromo or mirror coat paper but other forms of paper could also be used. Further, the paper may be one containing Titanium dioxide or devoid of it.

It is preferred that the plastic component is selected from polypropylene, polyethylene, polyester, polyvinyl chloride and combinations thereof. Suitable plastic (thermoplastic) materials for which forms the plastic component of the laminate include polypropylene (such as biaxially oriented polypropylene ("BOPP")), polyethylene, polyethylene terephthalate ("PET"), polyester, polyvinyl chloride ("PVC"), and suitable combinations thereof. Thermoplastic material is preferably selected to retard the loss of moisture from the bar soap composition upon storage. It is preferred that thickness of the plastic component is 6 to 12 μm , more preferably 8 to 12 μm . These plastics can contain various additives such as colorants, fillers, thickeners, catalysts and ultraviolet and other light absorbing compounds.

It is preferred that the grammage of each of the first, second and third adhesive coated portion is in the range of 3 to 10 g/m^2 . Each adhesive-coated portion could comprise a coating of any pattern. It is preferred that the coating is of knurled pattern. In the case of preferred laminates, the width of the second adhesive-coated portion is 5 to 30% of the total width of the wrapper as defined by the third and fourth edges. It is particularly preferred that one of the ends of the second adhesive-coated portion is flush with the third edge of the wrapper. Similarly, it is preferred that the third adhesive-coated portion is from 5 to 30% of the total width of said wrapper as defined by said third and fourth edges. It is also particularly preferred that one of the ends of the third adhesive-coated portion is flush with the fourth edge of the wrapper. In a particularly preferred embodiment, each of the second and third adhesive-coated portions is located about an imaginary line between the first and second edges which divides the wrapper into two equal halves with a major part of the second and said third adhesive-coated portions lying in the half towards the second edge. In other words, the second and third adhesive coated portions are positioned slightly offset from the imaginary centre-line of each wrapper with a major part of each portion lying in the half towards the second edge. The second and the third adhesive-coated portions are utilized for forming the end-seals or the envelope seals of the wrapper package.

Furthermore, it is preferred that width of the first adhesive-coated portion is from 5 to 20% of the total length of said wrapper as defined by said first and second edges. It is further preferred that one end of this first adhesive-coated portion is flush with the first

edge of each wrapper. The first adhesive-coated portion is useful for forming the longitudinal lap-seal of the wrapper package.

Generally it is observed that for given specifications of a laminated wrapper, for example a wrapper containing 30 g/m² paper component laminated to a 12 µm polyethyleneterephthalate (PET) component, where the paper component is usually coated with a 15 g/m² grammage of hot melt adhesive, the total grammage of the finished ready-to-use wrappers is about 75 to 80 g/m². In the case of disclosed wrappers, at identical specifications of the paper and the polyethyleneterephthalate components, but having the adhesive applied only at the adhesive-coated portions at a grammage of 5 g/m², the total grammage of the wrapper material is in the range of 65 to 70 g/m². This implies that meterage, i.e., the number of soap bars that could be packaged in 1 meter of the wrapper material is more in the case of the wrapper material disclosed herein.

It is also generally observed that conventional wrapper material tends to reverse-curl on unwinding which is a cumbersome technical problem for the packaging industry. By reverse-curling is meant that the wrapper material tends to curl and be biased towards a direction which is away from the direction to be folded which is intended during packaging process. Packaging soap bars is an automated process where even a minor impediment like reverse-curling could lead to serious loss of productivity. However, it is surprisingly found that the laminate material disclosed herein has significantly lesser tendency towards reverse-curling.

The sheet of laminate could be severed into any shape, particularly a 4-sided shape. However it is preferred that wrapper is rectangular in shape. The dimensions of each wrapper could be appropriately selected to suit the shape and size of the article, particularly the soap bars.

The paper component of the laminate is preferably selected from poster, chromo or mirror coat paper.

The plastic component is preferably printed, more particularly reverse-printed. It is also preferred that this plastic component is further coated with a heat-sealable lacquer

which aids heat sealing with the paper component when the two surfaces are lap-sealed or end-sealed.

Purpose of the adhesive is to provide for a sealing surface. Accordingly, any suitable adhesive could be selected depending on the availability and the properties desired. It is preferable to select an adhesive which is active only at the time of packaging by an activator. It is more preferred that the adhesive is selected from heat-activated sealing materials, wax, blends, resin, heat-seal-varnish or rosin. An example of heat-activated sealing material is hot melt adhesive, which preferably is sealable in the running temperature range of 130 to 190 °C.

Hot melt adhesive is particularly preferred over a cold adhesive for lap type of seal as the cold adhesive requires to be coated on both the surfaces which overlap for the seal whereas application of hot melt adhesive on a any single surface of the two overlapping surfaces is enough for a lap seal. Also, the bonding of the two sealed surfaces is stronger with a hot melt adhesive as compared to a cold adhesive, thereby offering better protection and hermetic seal quality. Cold seal packaging materials also need to be stored in a climate controlled room which may not be desired from a cost-perspective. Also heat-seal film is generally cheaper than cold seal film. Therefore the hot melt adhesive is preferred over a cold adhesive for a better and cost saving option.

For coating the adhesive, especially the hot melt adhesive, it is preferable to use a screen of 60 to 80 lines per square inch. The adhesive is coated using an etched cylinder and a doctor blade.

Wrapper:

In a second aspect is disclosed a wrapper for soap bar, the wrapper comprising a paper component laminated to a plastic component, and opposed first and second edges and opposed third and fourth edges, wherein the paper component of each wrapper comprises:

- (i) a first adhesive-coated portion located along substantially the entire length of said first edge;
- (ii) a second adhesive-coated portion located between said first and second edges and along a part of the length of said third edge; and,
- (iii) a third adhesive-coated portion located opposite said second portion along a part of the length of said fourth edge.

Stiffener

A typical commercial packaged bar of soap generally contains a stiffener, therefore it is preferred that a bar of soap packaged in a disclosed wrapper also contains a stiffener. The main purpose of stiffener is to add mechanical strength. A typical stiffener's grammage is from 100 to 200 g/m² and thickness is of the order of 50 to 250 µm, more preferably 160 to 180 µm. Preferably the stiffness of the stiffener is at least 3 Taber Stiffness units in each of the longitudinal (machine) and transverse (cross) directions, and more preferably at least 8 Taber Stiffness units in at least the machine direction. The stiffener could be made of coated or uncoated paper. It may also be made of coated or uncoated paper board. It may also be made of plastic or a laminate of paper and plastic, generally known as polycoated paper. More preferably, it is made from paper board, coated on one side with a polyethylene coating. Polycoated papers are advantageous as in addition to providing strength, they also prevent or reduce loss of aroma/perfume and volatile components from the packaged bar.

In a typical wrapping method, the wrapper is wrapped around a bar of soap and stiffening member and its first and third edges are brought in overlapping relationship to form the lap seal. This allows those edge portions to be secured to one another. Lap seal is particularly preferred and desired over a fin seal as it requires less of packaging material.

Examples

The invention will now be described in further details with the help of non-limiting
 5 examples.

Example 1: Comparative performance of a conventional laminate against a preferred
 laminate

10 The specifications and properties of a conventional and a preferred laminate are given
 in table 1. The observations are also included therein.

TABLE 1

Specifications/ property	Conventional	Preferred
Paper type	Poster paper with TiO ₂	Poster paper with TiO ₂
Paper grammage	40 g/m ²	40 g/m ²
Plastic component	Reverse printed Polyethyleneterephthalate	Reverse printed Polyethyleneterephthalate
Thickness of the plastic component	8 µm	8 µm
Wrapper length (i.e., distance between first and second edges)	175 mm	175 mm
Wrapper width (i.e., distance between third and fourth edges)	130 mm	130 mm
Adhesive	Hot melt adhesive	Hot melt adhesive
Adhesive applied	Paper component fully coated	Only 3 portions of paper component coated
Pattern	No pattern	Knurled pattern
Adhesive grammage	15 g/m ²	5 g/m ²
Width of first coated portion	NA	25 mm; entire portion from the third to the fourth edge was coated
Width of second coated portion	NA	21 mm
Width of third coated portion	NA	21 mm
Length of second coated portion	NA	50 mm
Length of third coated	NA	50 mm

portion		
	Observations	
Meterage/per kg material	~ 98 m	~ 112 m
Number of soap bars of 125 g packaged per kg of material	550 to 560	630 to 645
Reverse curling	Observed	Not observed

The illustrated example clearly indicates how the preferred embodiment meets the unmet need for more sustainable and robust wrappers for soap bars.

Claims

1. A sheet of laminate comprising a paper component laminated to a plastic component, said sheet comprising, and severable into, plurality of discrete wrappers, each comprising opposed first (1) and second edges (2) and opposed third (3) and fourth edges (4), wherein the paper component of each wrapper comprises:
 - (i) a first adhesive-coated portion (6) located along substantially the entire length of said first edge;
 - (ii) a second adhesive-coated portion (7) located between said first and second edges and along a part of the length of said third edge; and,
 - (iii) a third adhesive-coated portion (8) located opposite said second portion along a part of the length of said fourth edge.
2. A sheet of laminate as claimed in claim 1 wherein grammage of said paper component is 30 to 70 g/m².
3. A sheet of laminate as claimed in claim 1 or 2 wherein thickness of said plastic component is 6 to 12 µm.
4. A sheet of laminate as claimed in any one of the preceding claims wherein grammage of each of said first, second and third adhesive coated portion is in the range of 3 to 10 g/m².
5. A sheet of laminate as claimed in any one of the preceding claims wherein each said adhesive-coated portion comprises coating of knurled pattern.
6. A sheet of laminate as claimed in any one of the preceding claims wherein width of said second adhesive-coated portion (7) is from 5 to 30% of the total width of said wrapper as defined by said third (3) and fourth edges (4).
7. A sheet of laminate as claimed in any one of the preceding claims wherein width of said third adhesive-coated portion (8) is from 5 to 30% of the total width of said wrapper as defined by said third (3) and fourth edges (4).

8. A sheet of laminate as claimed in any one of the preceding claims wherein each of said second and third adhesive-coated portions is located about an imaginary line (5) between said first (1) and second edges (2) which divides said wrapper into two equal halves, with a major part of the second (7) and said third adhesive-coated portions (8) lying in the half towards the second edge (2).
9. A sheet of laminate as claimed in any one of the preceding claims wherein width of said first adhesive-coated portion (6) is from 5 to 20% of the total length of said wrapper as defined by said first (1) and second edges (2).
10. A sheet of laminate as claimed in any one of the preceding claims wherein each wrapper is rectangular in shape.
11. A sheet of laminate as claimed in any one of the preceding claims wherein said paper component is selected from poster, chromo or mirror coat paper.
12. A sheet of laminate as claimed in any one of the preceding claims wherein said plastic component is selected from polypropylene, polyethylene, polyester, polyvinyl chloride and combinations thereof.
13. A sheet of laminate as claimed in any one of the preceding claims wherein said adhesive is selected from heat-activated sealing materials, wax, blends, resin, heat-seal-varnish or rosin.
14. A wrapper for soap bar, the wrapper comprising a paper component laminated to a plastic component, and opposed first and second edges and opposed third and fourth edges, wherein the paper component of each wrapper comprises:
 - (i) a first adhesive-coated portion located along substantially the entire length of said first edge;
 - (ii) a second adhesive-coated portion located between said first and second edges and along a part of the length of said third edge; and,
 - (iii) a third adhesive-coated portion located opposite said second portion along a part of the length of said fourth edge.