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A FLEXIBLE TUBULAR PACKAGE**Field of the Invention**

5 The present invention relates generally to a flexible, elongate overwrap package having a generally tubular configuration with flattened ends and a longitudinal seam useful as a reinforced tear strip for opening the package. The overwrap can be used to protect sanitary protection products such as tampons during
10 storage, before use.

Background of the Invention

15 Packages for tubular products are known in the art. In applications where it is important to protect the enclosed product from contamination due to inadvertent opening, such as tampon overwraps, the package is formed of materials which are relatively strong. Such packages are often formed of plastic films, paper, and coated paper. The use of strong materials increases the
20 difficulty which a user faces in opening the package in a controlled manner and at a controlled location.

Attempts to provide overwraps formed of materials having relatively high tensile, burst, and tear strengths while nonetheless allowing for controlled opening of the
25 package include Kadel, U.S. Patent No. 5,133,457, and Norquest et al., U.S. Patent No. 4,881,644. These packages utilize materials such as voided polypropylene film, low density polyethylene, and paper. The wrappers described in these references include wrap separating
30 means such as score lines which run perpendicular to the length dimension of the package. The use of score lines to preferentially locate overwrap openings has several drawbacks. First, forming score lines requires a high degree of process control to avoid forming undesirable

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perforations in the overwrap material. Such perforations can be a source for contamination. Second, the formation of score lines in the package requires additional process steps beyond those necessary to form the package itself.

Therefore, what is needed is a simple, strong overwrap package which has a generally tubular shape and which incorporates features to help the user to open the package in a controlled manner at a controlled location.

Summary of the Invention

The present invention relates to a flexible, overwrap package formed of a generally tubular sheet of packaging material having an outer surface and a sealable inner surface. The packaging material is formed into a tube and sealed along a longitudinal seam and first and second generally flattened ends. The sealed package has a first lateral side. The longitudinal seam is oriented proximate the first lateral side of the first and second generally flattened ends. The seam has (a) a first narrow longitudinal strip portion of outwardly facing, sealable inner surface which is superposed over a corresponding longitudinal strip portion of the outer surface, (b) a second narrow longitudinal strip portion of outwardly facing outer surface adjacent said sealable inner surface, and (c) a third narrow longitudinal strip portion of inwardly facing sealable inner surface which is superposed over and sealed to the first and second longitudinal strip portions. Preferably, the first narrow strip is formed by folding a portion of the inner surface of the packaging material back over the outer surface. The seam therefore, provides a reinforced tearing strip, and a tear originating at the first generally flattened end proximate the longitudinal seam away from the first lateral side is

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capable of following the longitudinal seam toward the second generally flattened end.

Brief Description of the Drawing

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Figure 1 is a perspective view of a tampon overwrap according to the present invention.

Figure 2 is a top plan view of the tampon overwrap.

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Figure 3 is a side elevation of the tampon overwrap.

Figure 4 is an end elevation of the tampon overwrap.

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Figures 5A and 5B are partial schematic representations of the process of making the package of the present invention.

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Figure 5C is top view of an additional schematic representation of the process of making the package of the present invention.

Detailed Description of the Invention

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Referring to Figs. 1-4, a flexible, overwrap package 10 is formed of a generally tubular sheet of packaging material 12 having an outer surface 14, a sealable inner surface 16, a longitudinal seam 18, and first and second generally flattened ends 20 and 22, respectively, having a first lateral side 24. The longitudinal seam 18 is oriented proximate the first lateral side 24 of the first and second generally flattened ends 20, 22.

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The seam 18 has a first narrow longitudinal strip portion of outwardly facing, sealable inner surface 26. This strip portion 26 is superposed over a corresponding

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longitudinal strip portion of the outer surface 28. The seam 18 also includes a second narrow longitudinal strip portion of outwardly facing outer surface 30 adjacent said sealable inner surface 26. Another portion of the seam 18 is a third narrow longitudinal strip portion of inwardly facing sealable inner surface 32 which is superposed over and sealed to the first and second longitudinal strip portions 26, 30. Preferably, the first narrow strip 26 is formed by folding a portion of the inner surface of the packaging material back over the outer surface 28. The seam 18 therefore, provides a reinforced tearing strip, and a tear originating at the first, generally flattened end 20 proximate the longitudinal seam 18 away from the first lateral side 24 is capable of following the longitudinal seam 18 toward the second, generally flattened end 22. In order to locate the beginning of the tear, a notch 34 can be formed in the first, generally flattened end 20.

In an alternative embodiment, the longitudinal seam 18 may also include reinforcing means 35. The reinforcing means 35 is preferably an element which is continuous along the length of the longitudinal seam 18. A representative, non-limiting list of useful reinforcing means 18, includes string, plastic tape, monofilament, a continuous line of a polymeric mass such as hot melt, cold glue, and the like.

In use, a consumer can grip the left side 20a of the first end 20 between the thumb and forefinger of the user's first hand, and the right side 20b of the first end 20 between the thumb and forefinger of the user's second hand. The user's second hand can then gently twist and/or tear the right side of the overwrap package 10 away from the left side, and a tear originated at the notch 34 will generally follow the seam 18 to expose the contents 36 of

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the overwrap package 10.

While the overwrap package 10 is illustrated as protecting an applicator tampon 36, it can also be used to protect relatively long objects such as digital tampons, tampon inserters, vaginal medication and/or spermicide applicators, feminine hygiene products, and the like.

The packaging material can be any suitable sheet-like material including, without limitation, polymeric films, paper, woven and nonwoven fabrics, any combination thereof, and the like. These sheet-like materials may be coated and/or laminated, as desired. Preferably, the packaging material is a polymeric film, paper or coated paper. More preferably, the packaging material has at least one sealable surface, e.g., a thermoplastic layer or a cohesive sealing layer, for mechanical sealing, heat sealing, ultrasonic sealing, cold sealing, or any combination thereof, and the like. In a particularly preferred embodiment, the packaging material is a polymer-coated paper. In a more preferred embodiment, the packaging material is polyethylene-coated paper. Such a coated paper is low density polyethylene-coated, white kraft paper having a basis weight of 55 g/m² (30 g/m² paper and 25 g/m² coating). This material is available as SUPRAFORM 67030-25 from PKL, of Linnich, Germany.

Referring now to Figs. 5A-5C, the overwrap package can be formed by conveying a sheet-like ribbon of flexible packaging material 100 in a machine direction corresponding to the longitudinal axis of the packaging material 100. The ribbon of packaging material 100 has a sealable surface 102 and an outer surface 104, first and second lateral edges 106 and 108, respectively, and a longitudinal axis. A first sealing strip 112 can be formed by folding a narrow portion of the packaging material 100 adjacent the first lateral edge 106

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approximately 180° back at a folding station 113.

The folded packaging material 100 can be formed into a tube 114 by wrapping the material 100 around a forming mandrel 116 which has a diameter corresponding to the inside diameter of the finished tubular overwrap package. The packaging material 100 is wrapped around the mandrel 116 so the sealable surface 102 forms the inside surface of the tube 114, the outer surface 104 forms the outside surface of the tube 114, and a sealable strip 118 adjacent the second lateral edge 108 overlaps the first sealing strip 112 and a second sealing strip 120 which is formed of the outer surface 104 which is disposed adjacent to the first sealing strip 112, away from the first lateral edge 106. The sealable strip 118 adjacent the second lateral edge 108 can then be sealed to the first and second sealing strips 112, 120, at a sealing station 121 to form a longitudinal seam 122, by means known to those of ordinary skill in the art. For example, the surfaces can be heat sealed, ultrasonically sealed, adhesively sealed, cold sealed, mechanically sealed, cohesively sealed, and the like.

The sealed tube 114 can then be separated at a separation station 125 to form individual package stock 124. This operation can be performed with cutting blades, rotary knife, shear cut, crush cut, water jet, straining preweakened areas, laser, and other separation operations known to those skilled in the art. The individual package stock 124 can be transferred onto carriers 126 moving transversely to the continuous tube. The timing of the transfer of the individual package stock 124 into the carriers 126 orients the longitudinal seam 122 to a position corresponding to a location proximate a lateral edge of the flattened ends when the ends are sealed. The orienting means 130 can orient the longitudinal seam 122

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by rotating the package stock 124 about 90°. The degree of rotation is not critical, and it can range from about 30° to about 150°. Thus, the rotation of the package stock 124 is sufficient to locate the seam 122 proximate the lateral edge of the flattened ends when sealed. The oriented package stock 132 can then be transferred to a first end sealing station 134, e.g., heated sealing wheels, rollers, and/or belts, which flattens and seals a first longitudinal end 136 of the oriented package stock 132. The flattened first longitudinal end 136 can also be notched. The overwrap package can then be filled with product and the second longitudinal end can be flattened and sealed. These steps are well known to those of ordinary skill in the art.

The specification and embodiments above are presented to aid in the complete and non-limiting understanding of the invention disclosed herein. Since many variations and embodiments of the invention can be made without departing from its spirit and scope, the invention resides in the claims hereinafter appended.



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WHAT IS CLAIMED IS:

1. A flexible, overwrap package comprising a generally tubular sheet of packaging material having an outer surface, a sealable inner surface, a longitudinal seam, and first and second generally flattened ends having a first lateral side, wherein the longitudinal seam is oriented proximate the first lateral side of the first and second generally flattened ends and the longitudinal seam comprises:
- a) a first narrow longitudinal strip portion of outwardly facing, sealable inner surface which is superposed over a corresponding longitudinal strip portion of the outer surface;
 - b) a second narrow longitudinal strip portion of outwardly facing outer surface adjacent said sealable inner surface;
 - c) a third narrow longitudinal strip portion of inwardly facing sealable inner surface which is superposed over and sealed to the first and second longitudinal strip portions;
- whereby a tear originating at the first generally flattened end proximate the longitudinal seam away from the first lateral side is capable of following the longitudinal seam toward the second generally flattened end.
2. The overwrap package of claim 1 wherein the sealable inner surface is a heat sealable surface.
3. The overwrap package of claim 1 wherein the longitudinal seam further comprises reinforcing means.
4. The overwrap package of claim 3 wherein the



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reinforcing means located between the third narrow strip portion and at least one of the first and second narrow strip portions of the longitudinal seam.

5 5. The overwrap package of claim 3 wherein the reinforcing means is selected from the group consisting of string, polymeric tape, and hot melt.

10 6. The overwrap package of claim 1 further comprising a notch located at the first generally flattened end whereby a tear can originate at a controlled location.

15 7. The overwrap package of claim 1 wherein the packaging material is selected from the group consisting of polymeric films, paper, and coated paper.

20 8. The overwrap package of claim 7 wherein the packaging material is coated paper.

 9. The overwrap package of claim 7 wherein the coated paper comprises a layer of paper and a layer of a polymeric coating.

25 10. A packaged applicator tampon comprising:

a) a tampon applicator having a barrel member containing a tampon and a plunger member which is configured for telescopically sliding within the barrel member and expelling the tampon from the barrel;

30 b) an overwrap package comprising a generally tubular sheet of packaging material having an outer surface, a sealable inner surface, a longitudinal seam, and first and second generally flattened ends



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having a first lateral side, wherein the longitudinal seam is oriented proximate the first lateral side of the first and second generally flattened ends and the longitudinal seam comprises:

- 5 i) a first narrow longitudinal strip portion of outwardly facing, sealable inner surface which is superposed over a corresponding longitudinal strip portion of the outer surface;
- 10 ii) a second narrow longitudinal strip portion of outwardly facing outer surface adjacent said sealable inner surface;
- 15 iii) a third narrow longitudinal strip portion of inwardly facing sealable inner surface which is superposed over and sealed to the first and second longitudinal strip portions;

whereby a tear originating at the first generally flattened end proximate the longitudinal seam away from the first lateral side is capable of following the longitudinal seam toward the second generally flattened
20 end.

FIG. 1

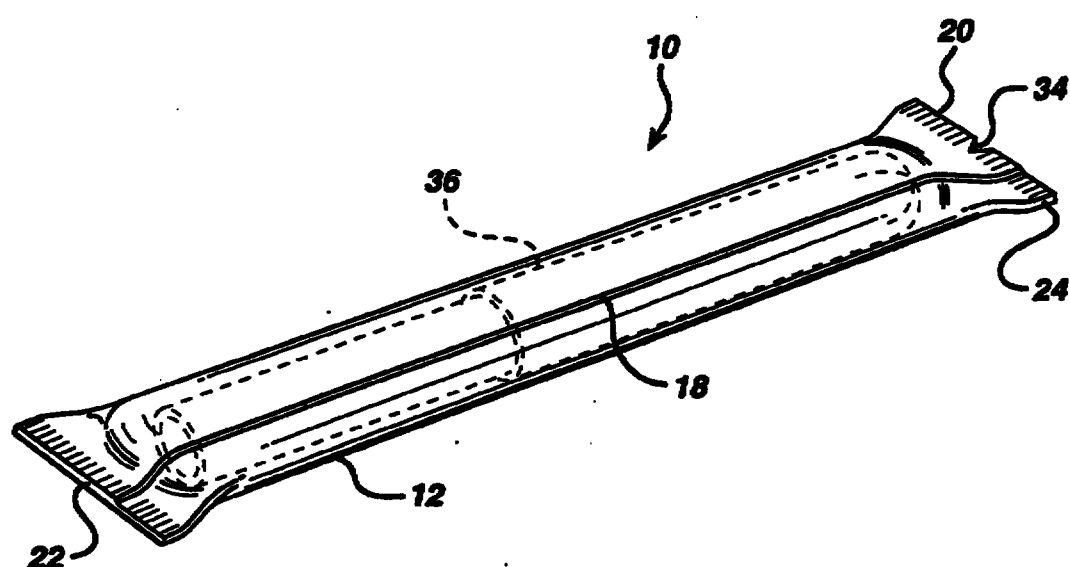


FIG. 2

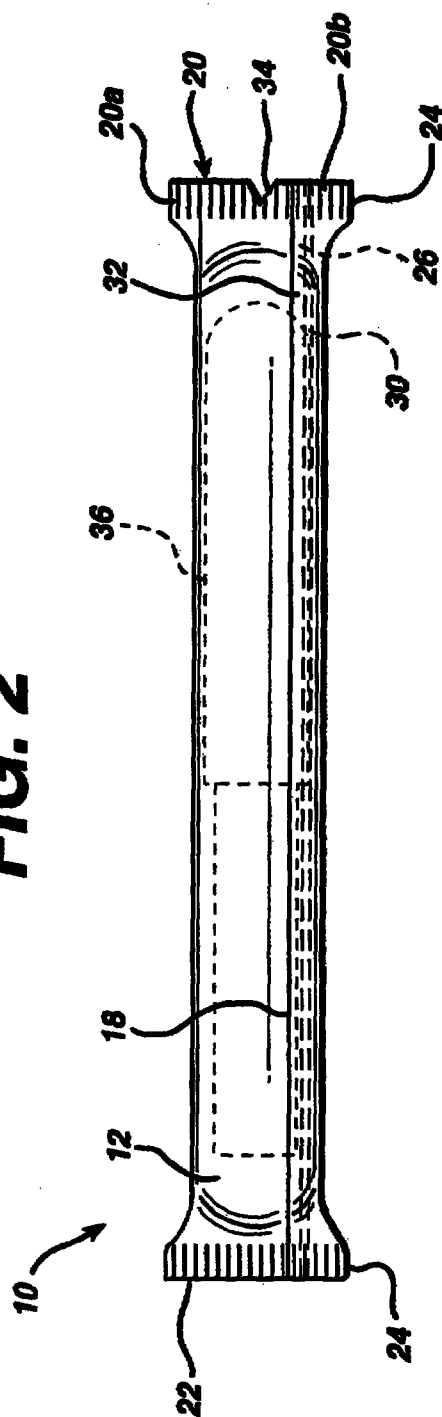


FIG. 3

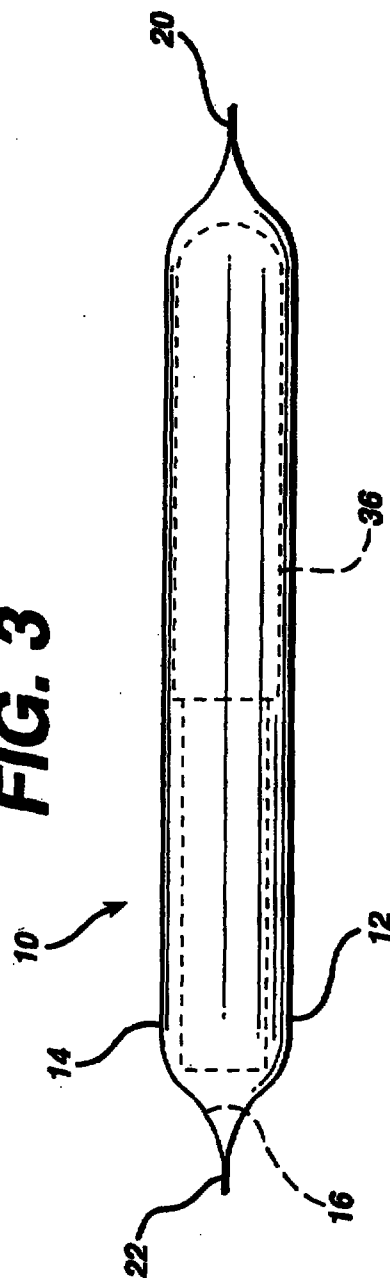


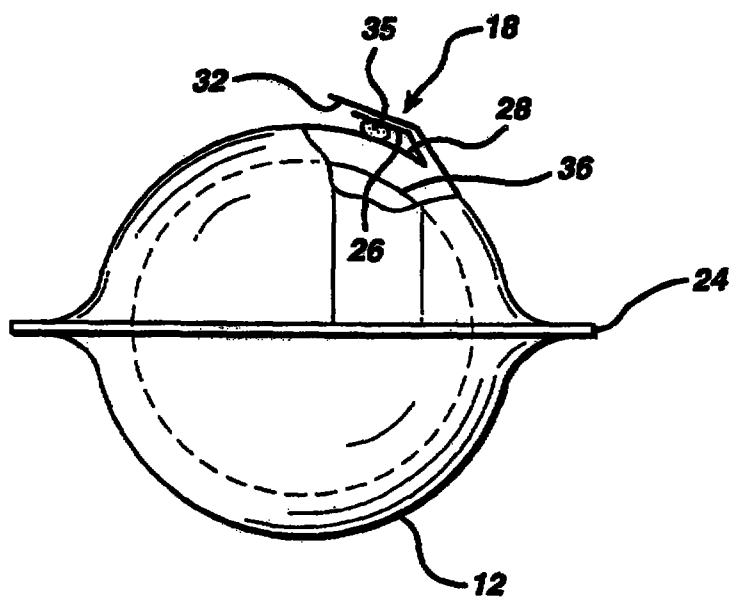
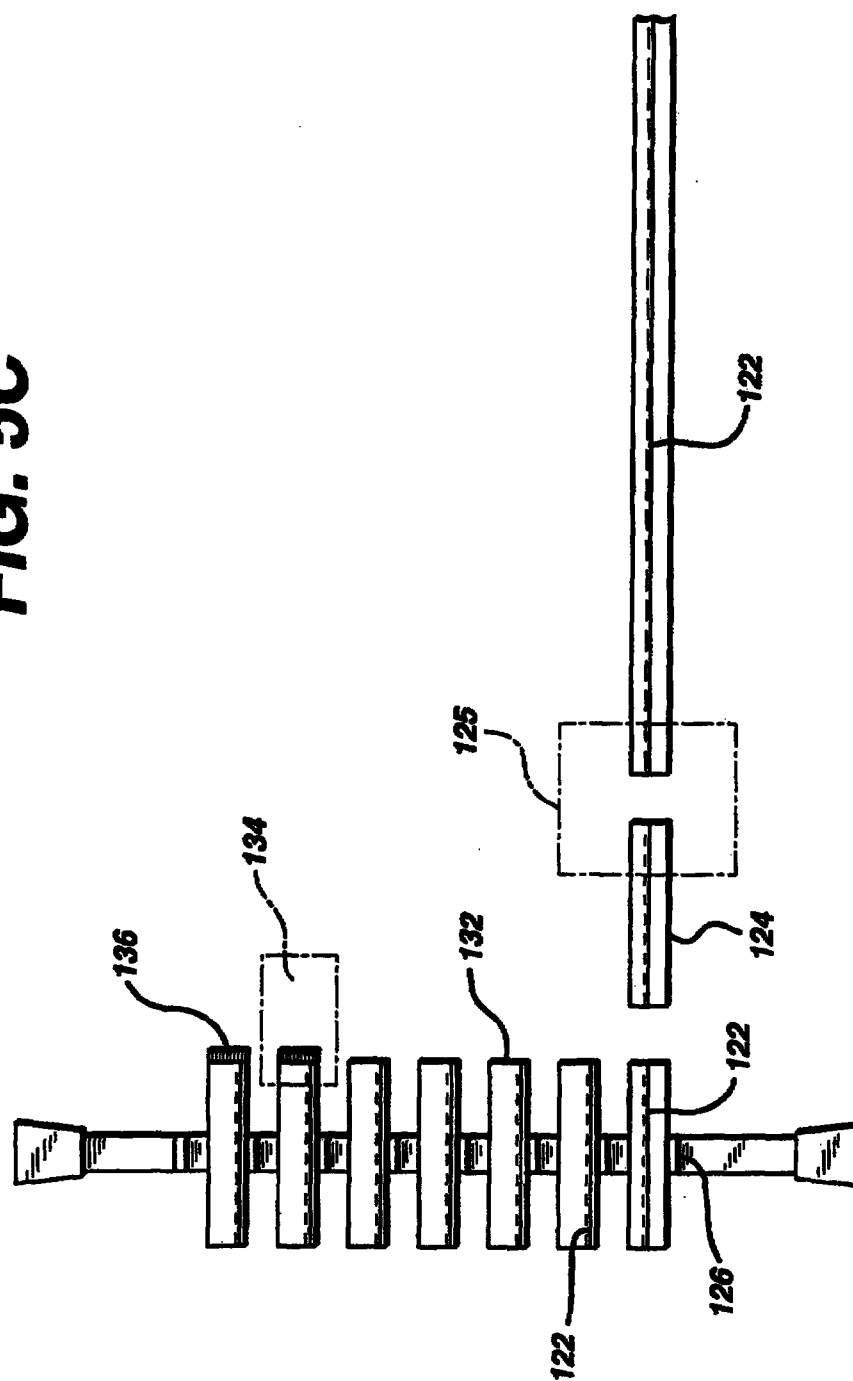
FIG. 4

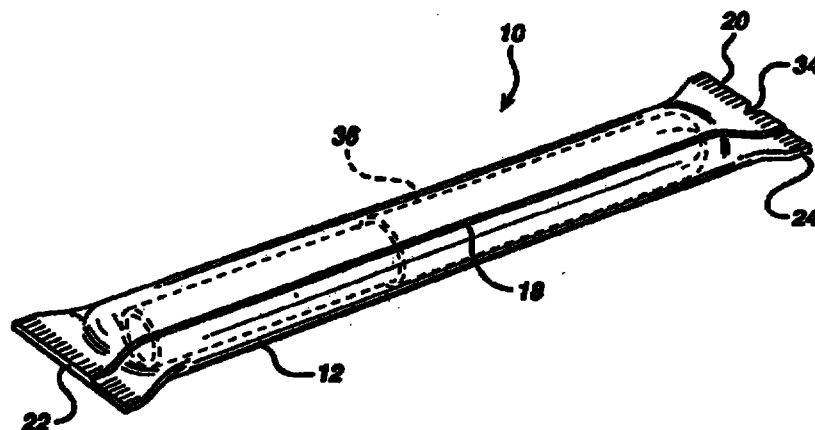
FIG. 5C

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(21) International Application Number: PCT/US96/01363 (22) International Filing Date: 1 February 1996 (01.02.96) (30) Priority Data: 08/382,321 1 February 1995 (01.02.95) US (71) Applicant: McNEIL-PPC, INC. [US/US]; Grandview Avenue, Skillman, NJ 08558 (US). (72) Inventors: ENGQVIST, Helena; 34C Chicopee Drive, Princeton, NJ 08540 (US). ISKRA, Michael; 1077 Tullio Road, Bridgewater, NJ 08807 (US). SCHOELLING, Hans, Werner; Dohlenwegg 11, D-58256 Ennepetal (DE). SMAGA, Rainer; Gauss-Strasse 15, D-44879 Bochum (DE). (74) Agents: CIAMPORCERO, Audley, A., Jr. et al.; Johnson & Johnson, One Johnson & Johnson Plaza, New Brunswick, NJ 08933-7000 (US).	(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AZ, BY, KG, KZ, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	

(54) Title: A FLEXIBLE TUBULAR PACKAGE



(57) Abstract

A simple, strong overwrap package which has a generally tubular shape and which incorporates features to help the user to open the package in a controlled manner at a controlled location is disclosed. The overwrap package has a longitudinal seam formed of: (a) a first narrow longitudinal strip portion of outwardly facing, sealable inner surface which is superposed over a corresponding longitudinal strip portion of the outer surface; (b) a second narrow longitudinal strip portion of outwardly facing outer surface adjacent said sealable inner surface; and (c) a third narrow longitudinal strip portion of inwardly facing sealable inner surface which is superposed over and sealed to the first and second longitudinal strip portions. Preferably, the first narrow strip is formed by folding a portion of the inner surface of the packaging material over the outer surface. The seam therefore provides a reinforced tearing strip, and a tear originating at the first generally flattened end proximate the longitudinal seam away from the first lateral side is capable of following the longitudinal seam toward the second generally flattened end. The method of making such packages is also disclosed.