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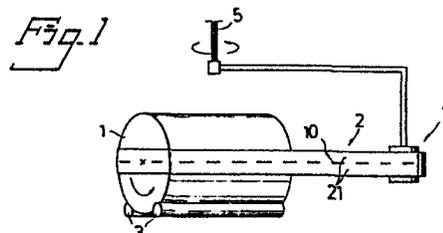
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54 **Goods wrapping with web-like material.**

57 In wrapping a product (1), a web-like wrapping material (2) is wound round the product in the form of at least two parallel strips (21), running substantially edge to edge, which are parted along at least a portion of the length of the section in consecutive length sections. The web (2) is arranged in the form of a stock (7), from which the web (2) is pulled out as two substantially parallel strips (21) running edge to edge, and parted along at least a portion of the section in consecutive length sections.



TITLE OF INVENTION

GOODS WRAPPING WITH WEB-LIKE MATERIAL.

TECHNICAL FIELD

5 The invention relates to a method in wrapping a product, where a web-like wrapping material is wound round the product. The invention also relates to a store of a wrapping material web which is to be wound round the product for carrying out the method. The invention also relates to an apparatus for wrapping a product.

10 BACKGROUND

At the present time goods are often wrapped by being wound round with a material web consisting of stretch film, for example. The wrapping operation is accomplished by the goods, e.g. a pallet with a stack of articles, being rotated about its axle relative a store of web-like wrapping material so that the latter is wound round the goods. Especially in the utilization of stretch film there occurs substantial wrinkling of the film transverse its winding direction, as well as enclosure of air between the film and the goods or underlying turns of the film. The result is that the wrapping is not given the desired smoothness and transparency.

20 Particularly with the wrapping technique where a cylindrical product is carried on two parallel, horizontal, spaced and rotating support rolls, while being wound with stretch film in a plane substantially containing the axis of the product, there may be substantial air enclosures at the end surfaces of the cylindrical goods. Particularly when a cylindrical product thus wrapped with stretch film is to be stood with one end surface on a substructure after the wrapping operation, it may occur that the enclosed air is compressed by the weight of the product and ruptures the wrapping, which may also generate a very sharp bang.

35 It is, of course, a desire with the envisaged wrapping technique to perform wrapping as rapidly as possible.

The wider the wrapping web is, the more rapidly can the wrapping operation be carried out. A desire often recurring is to have the wrapping web of substantially the same height as the goods, at least when the latter has a uniform cross section along an axis at right angles to the longitudinal direction of the wrapping material web, and parallel to the plane of the web. The winding speed is preferably kept as high as possible as well.

It has been found, however, that the air enclosures and wrinkling of the wrapping material web in its transverse direction become troublesome even for relatively low winding speeds, and even for relatively small width of the wrapping material web.

An object of the invention is therefore to propose a method, an apparatus and a wrapping material web store which substantially limit the air enclosures in the wrapping, limit the tendency of the web to wrinkle transverse its longitudinal direction on the goods, and thereby permit increased winding speed and/or increased width of the material web.

CHARACTERIZATION OF THE INVENTION

The inventive method relates to wrapping a product by winding a web-like wrapping material, preferably stretch film, about the product. In accordance with the invention, the wrapping material is wound in the form of at least two parallel strips running substantially edge to edge, which in consecutive length sections are separated from each other along at least a portion of the section length. The strip material can be arranged in the form of a coil which is orbited relative to the product in an encompassing path round the product while being drawn out and wound round the product. The method is particularly well found in the cases where the surface of the product to be wrapped has varying distance from the rotational centre of the film orbiting along its wrapping periphery.

The strip material can be arranged in the form of

a single web in a store, e.g. a web material coil, which is orbitted relative the product, the web being slit while being withdrawn from the store to form the said strips.

5 A store of a wrapping material web which is to be wound round a product for carrying out the method is essentially distinguished in that the web has the form of two strips which are substantially parallel and run edge to edge during withdrawal from the store, said strips being separated from each other, at least along a portion
10 of the length of the section, in consecutively following length sections.

The web may be perforated, the perforations preferably having the form of slits which extend in the longitudinal direction of the web. The strips of the material web can
15 also be completely separated and arranged as contiguous coils on a common core.

The outer end of the web may be arranged cuneiformed with the tip of the cuneiform shape at the web end, and substantially at the parting line between the strips of the
20 web.

A preferably weakly adhesive glue spot can be arranged between the tip portion of the web and the nearest underlying turn of the web. Detection marking can furthermore be arranged on the web in the area of the end of the web,
25 such marking being a spot of ferromagnetic material, for example, which can be detected for indicating the need of new web stock.

The apparatus comprises a conventional wrapping device that is holder for a stock of or guide for a wrapping material web and means for relatively rotating the holder or
30 guide and the article so as to wrap the article, and is distinguished by means for slitting the web in a position between the article and the holder or guide, said slitting means being arranged to slit the web into at least two
35 strips as it passes the slitting means during a wrapping operation.

The invention is defined in the appended claims.

The invention will now be described in detail in the form of an example, with reference to the appended drawing.

DRAWING

Fig. 1 schematically illustrates a wrapping plant with a stock of material web in accordance with the invention. Fig. 2 schematically illustrates an alternative plant in which the method and stock in accordance with the invention may be utilized. Fig. 3 schematically illustrates the function of the inventive technique. Fig. 4 schematically illustrates a stock in accordance with the invention. Fig. 5 schematically illustrates an alternative stock in accordance with the invention. Fig. 6 illustrates an apparatus for carrying out the method in accordance with the invention. Fig. 7 is a view taken along the line VII-VII in Fig. 6.

EMBODIMENT EXAMPLES

A cylindrical product 1 is illustrated in Fig. 1, e.g. a paper coil from a paper mill. The coil 1 is to be wrapped with a web 2 of stretch film. For this purpose the coil 1 is carried by two parallel, spaced rotating rolls 3, so that the coil 1 rotates about its axis 4, which can be assumed to be in a horizontal plane. The web 2 is then unwound in the horizontal plane about the roll 1 while being withdrawn from a stock coil 7 carried by, and orbited about an axis 5, which is thus vertical and placed approximately directly above the product 1. With the aid of perforations 10 the stretch film 2 is pierced along the whole of its length to form two strips 21 which are kept together by the material remaining between the individual perforations 10.

It is naturally a desire to minimize the time taken for wrapping the product 1. In principle, this minimization can be achieved by two measures, namely utilizing as wide a web 2 as possible, and by orbiting the stock 7 at a speed as great as possible about the axis 5 relative the product 1.

Turning now to Fig. 3, there is here illustrated a side view of the product 1 in Fig. 1, and the film 2 is schematically depicted such as it appears after having been wound about the end edge of the product 1. By the stock 7 being orbited at relatively great speed, the web 2 will have a curved profile due to the slipstream, and furthermore this curved configuration is emphasized by the film 2 being curved by contact with the end edge of the product 1. The result will be that the end edges of the film 2 will come into contact with the product while encapsulating air in a space 8 between the film 2 and the surface of the product 1. Due to the perforations 10, the air which tends to be encapsulated can flow out again through said perforations, as illustrated by the arrows in Fig. 3. The perforations 10 also let air through during the winding process itself, before the film part pulled out from the stock 7, has yet come into contact with the product 1, for which reason the film 2 will not assume such an accentuated curvilinear configuration.

By having the film 2 provided with perforations 10, or the like, in accordance with the invention, the transverse profile of the film 2 will not be as curved, and this means in turn that the heavy transverse wrinkling of the film 2 previously experienced along the cylindrical surface of the product 1 will not be so accentuated as previously.

Fig. 2 illustrates a standing stack 1a of articles, e.g. such as are carried on a pallet, this stack being rotated on a turntable 30 while the film stock 7 is vertically raisable and lowerable, the film 2 being wound onto a mantle surface of the stack 1 by rotation of the turntable 30. In this case as well, the stretch film 2 will tend to assume the curved profile illustrated in Fig. 3, this tendency being heavily reduced, however, by the inventive perforations 10.

Fig. 4 illustrates a stock in accordance with the invention, in the form of a coil 7 of a stretch film web 2 divided into two strips 21 with the aid of a perforation 10.

Fig. 5 illustrates an alternative stock in accordance with the invention, comprising a coil 7 of a stretch film web 2, which is pierced along the whole of its length by a slit 100 to form two completely separate strips 21 lying edge to edge, adapted on a common core 18. Figs. 6 and 7 illustrate how the stock 7 may consist of a stretch film web without any perforations or slits, the stock being arranged in the form of a roll from which the stretch film web is wound off. A disc-like serrated slitting knife 41 is arranged in contact with the web 2, which is drawn from the stock 7 such that under rotation the knife perforates the web with a plurality of slits 10 as illustrated in Fig. 7, the inventive effect thus occurring.

As will be seen from Fig. 4, the forward end of the stretch film may be cuneiform and provided with a glue spot 40 for retaining the film end on the roll during transport of the film roll, and also serving to allow simple connection of the outer end of a new coil of film to the inner end of a coil of film which is about to become exhausted. Although not more closely illustrated, the stretch film in the area of its terminal end may be provided with a detectable marking, e.g. in the form of a magnetically or optically detectable spot, which can be read off for indicating the need of replacing a film stock with a new one.

The web 2 is perforated or slit at preferably about half its width, when two strips 21 are to be formed. If more strips are to be formed, the slits or perforations are placed so that the strips are mutually just as wide.

The inventive technique has its use, particularly when the strips are wound with partial overlapping of the turns, whereby the slits, perforations or the like, of the web will be covered by the strips in turns lying on top.

As indicated above the web material is generally air tight or air catching, in an extent such that it tends to behave in the manner described in the background portion of the specification. A typical web material with such properties is plastics stretch film, but the invention is

applicable also for other conventional wrapping webs, such as plastics foils or paper, which are used not only for stabilizing the wrapped article or article stack, but also for protecting the article or stack against the environment, e.g. rain.

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CLAIMS

1. Method in wrapping a product (1) where a web-like wrapping material (2) is wrapped round the product, characterized in that the wrapping material is wound in the form of at least two parallel strips (21) running substantially edge to edge, which in consecutive length sections are parted from each other along at least a portion of the length of the section.

2. Method as claimed in claim 1, characterized in that the web material is arranged in the form of a coil (7) which is orbited relative the product in a path going round the product (1) while said web is being pulled out and wound round the product.

3. Method as claimed in claim 1, characterized in that the product (1) is cylindrical and that the web material (2) is wound round the product in a fixed plane substantially coinciding with the axis of the product, and preferably while the product is rotated about its axis.

4. Method as claimed in any of claims 1-3, characterized in that the web material is arranged in the form of a single web (2) in a stock which is orbited relative the product and that the web is slit to form said strips while being pulled out from the stock.

5. Stock of wrapping material web which is to be wound round a product (1) for carrying out the method in accordance with claim 1, characterized in that the web (2) has the form of two substantially parallel strips (21) running edge to edge while being drawn out from the stock, said strips being separated from each other along at least a portion of the length of the section in consecutive length sections.

6. Stock as claimed in claim 5, characterized in that the web is perforated, the perforations (10) preferably having the form of slits extending in the longitudinal direction of the web.

7. Stock as claimed in claim 5, characterized in that the strips of material web are arranged on a common core.

8. Stock as claimed in any of claims 5-7, characterized in that the outer end of the web is arranged cuneiform with the tip of the cuneiformity substantially at the parting line between the strips of the web.

9. Stock as claimed in any of claims 5-8, characterized in that a weakly adhesive glue spot (40) is arranged between the tip portion of the web and the adjacent, preferably nearest underlying turn of the web.

10. Stock as claimed in any of claims 5-9, characterized in that a detection marking is arranged on the web in its terminal area, said marking consisting, for example, of a spot of ferromagnetic material which can be detected for indicating the need of new web stock.

11. Apparatus for performing the method of claim 1, comprising a holder for a stock of wrapping material web or guide for the web, and means for relatively rotating the holder or guide and the article to be wrapped so as to wrap the article, characterized by means for slitting the web in a position between the article and the holder or guide, said slitting means being arranged to slit the web into at least two strips as it passes the slitting means during a wrapping operation.

Fig. 1

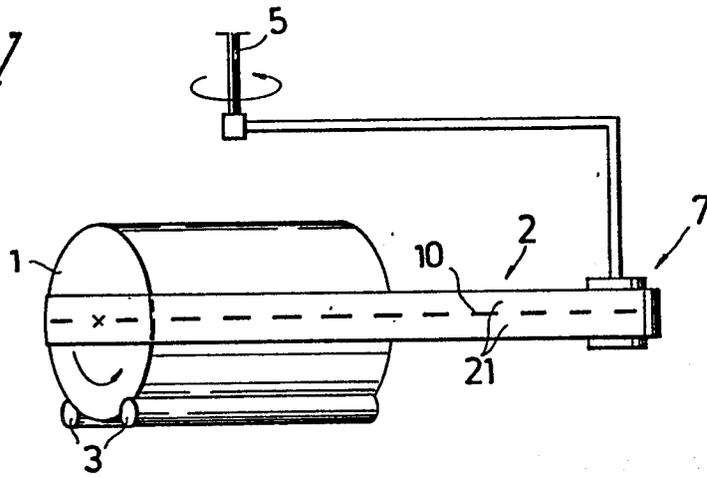


Fig. 2

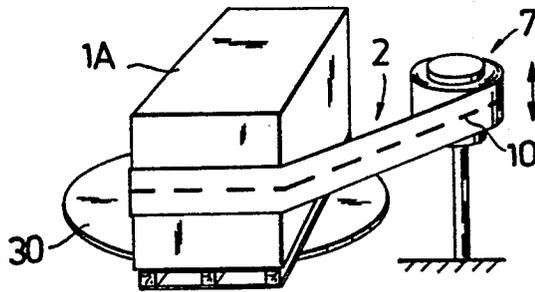


Fig. 3

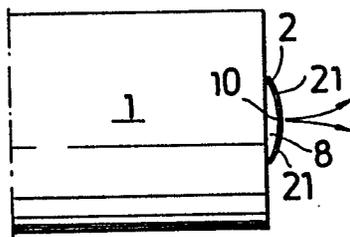


Fig. 4

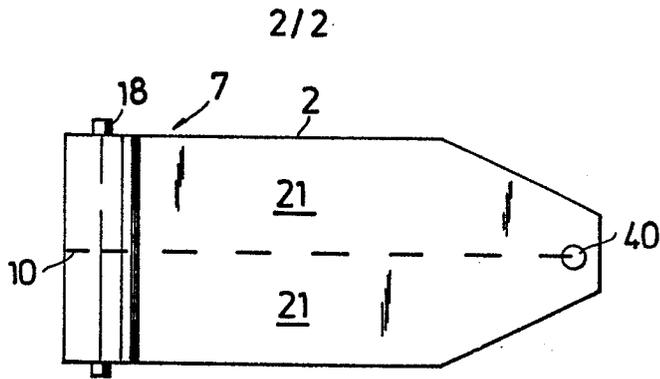


Fig. 5

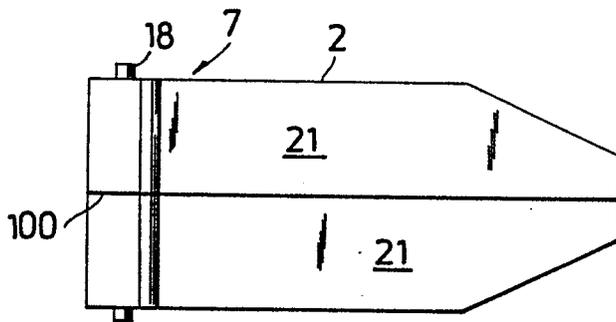


Fig. 6

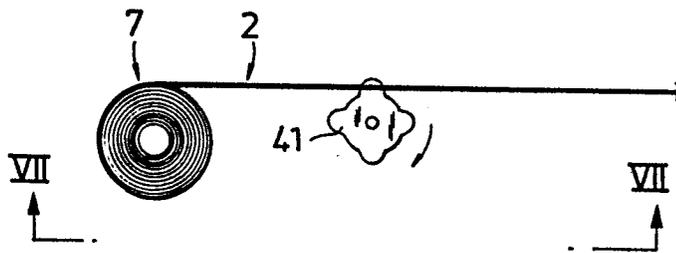
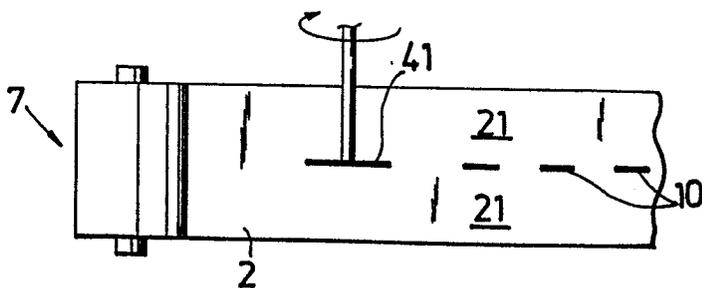


Fig. 7





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
A	US-A-3 043 071 (SADELL) * Whole document; column 1, lines 49-57 *	1	B 65 B 11/04 B 65 D 65/22
A	US-A-4 079 565 (LANCASTER) * Abstract; figures 1,2 *	2	
A	US-A-4 281 500 (MUELLER) * Column 3, lines 34-66; figures 1A-1G *	3	
			TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			B 65 B B 65 D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25-01-1984	Examiner CLAEYS H.C.M.
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			