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(54) Food-packing film

(57) A film of a ribbon-shaped synthetic material (20) is wound as a roll on a supporting core (14). At least one of the side edges of the film ribbon is incised with small cuts (18) at right angles to said side edges, at spaced intervals along it.

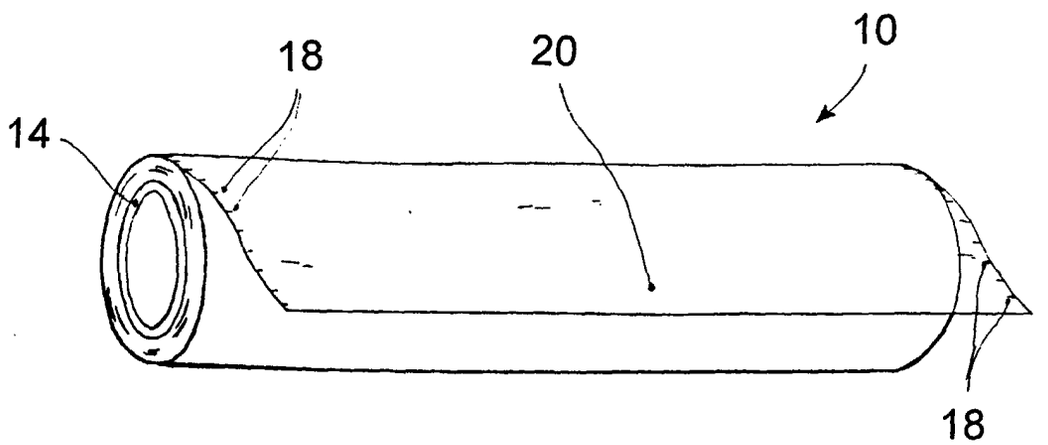

Fig.1

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Description

[0001] This invention relates to an improved film of synthetic material, particularly, though not exclusively, polyethylene or polypropylene, especially for packing foodstuff.

[0002] It is known to use polyethylene films both in the home and in canteens, self-service restaurants, etc., for covering trays or food-containers in order to protect foodstuffs from outside contamination. These films are generally transparent and are made adhesive on one or both their faces so that they will stick to the smooth surface of trays or containers and seal them. The films are typically manufactured in the form of ribbons, so that they can be rolled up on a cylindrical cardboard core, and they are packed in cardboard boxes having a rectilinear slot, parallel to the axis of the roll, through which slot the film is pulled out.

[0003] In order to make it easier to tear the film in pieces having a desired length, a metal saw, extending along the whole length of one of the edges parallel to the slot, is attached to the box in such a way that the cutting border slightly projects beyond the edge. The user, after pulling the desired amount of film out of the box, can then sever it by pressing it against the saw along the line of the desired cut, and by exerting a moderate pull.

[0004] This kind of film, though efficient from the point of view of its mechanical and isolating properties, as well as of its features of adhesion to the container, has some disadvantages in respect of the cutting process. In order to make it easier to start the tear after pulling out the desired length of film, the latter must be grasped near the saw, in order to apply the stress in the area where the tear should be started. However, in the course of household duties and even more so in canteens, self-service and fast-food restaurants, etc., where the speed of preparation and packing of pre-cooked dishes is a paramount, the operator seldom follows these steps, even if they are important. Therefore, whenever the film is used without the necessary cautions mentioned above, it offers a considerable resistance to initial tearing. During pulling and before tearing, the film tends to be plastically warped and curled, and to stick to itself, thus becoming more and more difficult to handle, so that the extracted length becomes unusable.

[0005] Another disadvantage of the known film is that attaching a saw to the container box is a relatively complex and time-consuming operation, which increases the manufacturing costs, due both to the cost of the saw itself and to the cost of the additional manufacturing equipment.

[0006] A further disadvantage of this film is that the user may be hurt by the metal saw, which must be sharp enough to produce a tear as smooth as possible. Not only the operator's safety is jeopardized thereby, but also the sanitary conditions of the packing process.

[0007] In an alternative known film shearing device, a saw is shaped directly on one of the major walls of the cardboard box, i.e. on one of the edges parallel to the slot through which the film is pulled. Consequently, no metal saw needs to be fastened to the box, and the problem of the injuries to the user is partly solved. However, the cardboard saw has an inherent lower efficiency than the metal saw, and the efficiency tends to decrease as the saw is used, because of the wear of the saw-teeth.

[0008] It is also known to incise polyethylene films with spaced transverse lines of short cuts to form preferential tearing lines. The disadvantage of these films is that the operator is limited to a choice of fixed sizes of the film pieces.

[0009] Film-holders are also commercially available, where a roll of film is rotationally supported, the film is extracted through a slot, and a slidable blade parallel to the slot can be operated to cut the film. However, these film-holders are heavy, cumbersome and expensive, so that, while they may be acceptable for professional use, they are less suitable for home use.

[0010] The main object of the present invention is therefore to overcome the above disadvantages, by providing an improved film of synthetic material, which can be smoothly cut without requiring neither tools nor particular care by the user.

[0011] Another object of the invention is to provide an improved film which does not require any associated cutting devices, such that may be liable to harm the operator, cause delays in the packing process and jeopardize the sanitary conditions of the packing.

[0012] It also an object of the invention is to provide the above improved film so that it can be manufactured cheaply and easily.

[0013] The above-mentioned objects and advantages, and other that will become apparent from the following description, are achieved by the invention with a food-packing film having the features recited in claim 1. The dependent claims state other advantageous features of the invention.

[0014] The invention will now be described in more detail with reference to the attached drawings, shown by way of non limiting example, wherein:

Fig. 1 is a perspective view of an improved food-packing film according to a preferred embodiment of the invention;

Fig. 2 shows an enlarged detail of the film of Fig. 1;

Fig. 3 shows a perspective, broken-away view of a roll of food-packing film and of a cutting tool used in its manufacture.

Fig. 4 is a perspective view of a box holding an improved food-packing film according to the invention;

[0015] With reference to Figs. 1 and 2, a ribbon of polyethylene film 20 is wound on a supporting cylindrical cardboard core 14, to form a roll 10.

[0016] According to the invention, the lateral edges of the film ribbon are incised with short cuts 18 at right angles to the edges and at spaced intervals along the edges. The cuts are about 1 mm deep and the intervals are less than 50 mm, preferably about 10 mm.

[0017] Preferably, film 20 is manufactured so that the preferential direction of tear propagation is transverse to the length of the ribbon. This can be achieved by means of a technique usable when manufacturing the polyethylene film by the so-called blown-film technology.

[0018] As known to the person skilled in the art, blown-film is manufactured by extruding a tubular film through an annular die, by pulling the film upwards and inflating it to form a bubble, while cooling and calibrating the bubble.

[0019] Within the above process, steps can be taken to obtain a ribbon where the macromolecules of polyethylene are prevalently oriented in a direction at right angles to the polymer flow (Transverse Direction or TD), so that transverse tears are favored, as persons skilled in the art will readily appreciate.

[0020] A transverse orientation of macromolecules can be achieved, for instance, if the value of the Blow Up Ratio (BUR), i.e. the ratio of the bubble diameter to the die diameter, usually in the range 1.5 to 6, is chosen near the upper limit of the range. A similar result can be obtained if the value of the Take-Up Ratio (TUR), that is the ratio of the pulling rate to the polymer delivery rate from the die, usually in the range 5 to 30, is chosen near the low limit in the range.

[0021] Cuts 18 can be made by any suitable process, e.g. by making the individual cuts, one by one, along the ribbon as it is fed along the manufacturing line. However, with reference to Fig. 3, according to a particularly advantageous method, the cuts are all made in one stroke in the finished roll of film, by means of a cutting tool 26 comprising spider-arranged cutting blades 28 between a hub 30 and a peripheral wall 32. Cutting tool 26 is arranged to hit the lateral surface of the roll of film 10 with an impact that will cause the sharp blades to penetrate the side surface of the roll for the desired small depth.

[0022] With reference to Fig. 4, the roll of film of the invention is preferably packed in a cardboard box 12 having a rectilinear slot 24, parallel to the axis the roll, through which slot the film can be pulled out by the user. According to an optional feature of the invention, box 12 carries a waxy strip 22 extending near one of its edges. The user, after pulling the desired amount of film 20 with one hand, presses the film down against the waxy strip and pulls downwards. The film will stick to the waxy strip and will offer a resistance to traction, so that a tear will start at the nearest cut 18. After the cut 18 has promoted the start of the tear, the tear will then propagate substantially along edge 16, which acts as a guide, because the preferential direction of tearing propagation is transverse to the roll.

[0023] It can be seen that the invention solves the stated problem, by providing an improved film which can be smoothly torn in a substantially transverse direction, without requiring particular care by the operator.

[0024] Another advantage of the invention is that it dispenses with any cutting devices, which may be dangerous for the user and may jeopardize the sanitary conditions of the foodstuff packing procedure.

[0025] A further advantage of the invention is that the cutting means are not liable to rapid wear and that their efficiency is substantially constant during the lifetime of the roll of film.

[0026] Another advantage of the invention is that the improved film, including the associated box and cuts, is cheap and easy to manufacture.

[0027] In practice, materials and sizes can be different from what has been shown, depending on requirements.

Claims

1. A ribbon-like food-packing film of a synthetic material, wound as a roll on a supporting core, **characterized in that** at least one of the side edges of the film ribbon is incised with small cuts at right angles to said at least one of the side edges, at spaced intervals along it.

2. The film of claim 1, **characterized in that** both side edges of the film are incised with said cuts.

3. The film of claim 1 or 2, **characterized in that** said cuts are about 1 mm deep.

4. The film of any of the preceding claims, **characterized in that** said intervals are less than 50 mm.

5. The film of any of the preceding claims, **characterized in that** said intervals are about 10 mm.

6. The film of any of the preceding claims, **characterized in that** it has a preferential direction of tear propagation that is at right angles to the longitudinal direction of the film ribbon.

7. The film of claim 6, **characterized in that** it comprises macromolecules prevalently oriented according to said preferential direction of tear propagation.

8. The film of any of the preceding claims, **characterized in that** said roll of film is contained in a box having a rectilinear slot and carrying a waxy strip extending near one of its edges.

9. The film of any of the preceding claims, **characterized in that** said cuts are obtained by hitting the side of the finished roll of film with a cutting tool compris-

ing spider-arranged cutting blades.

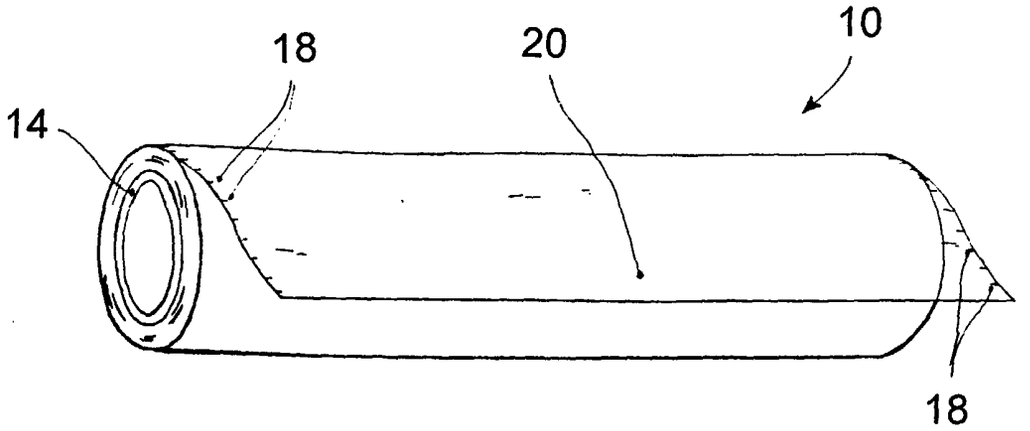

Fig.1

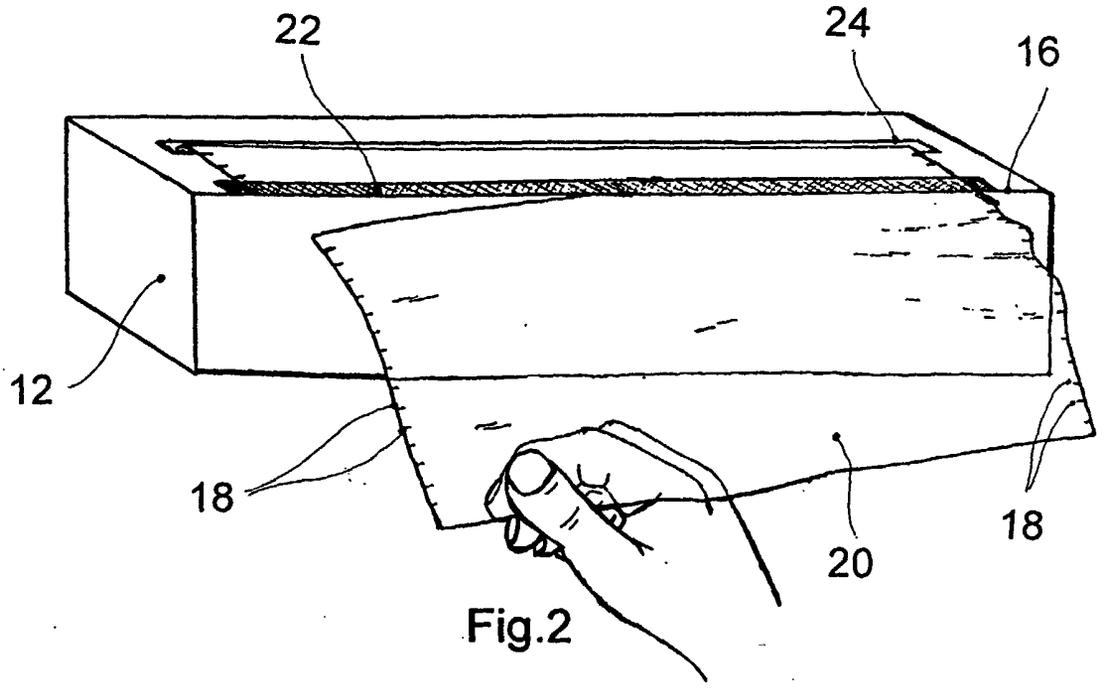

Fig.2

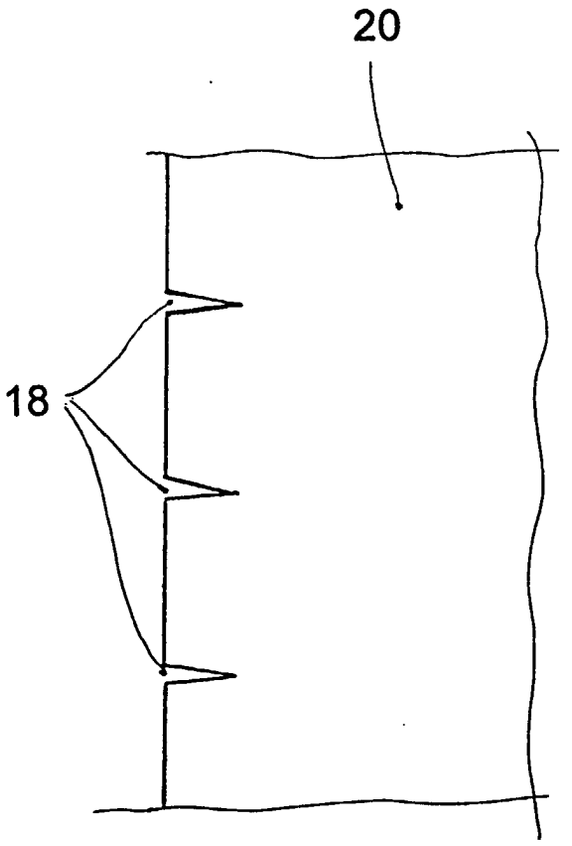

Fig.3

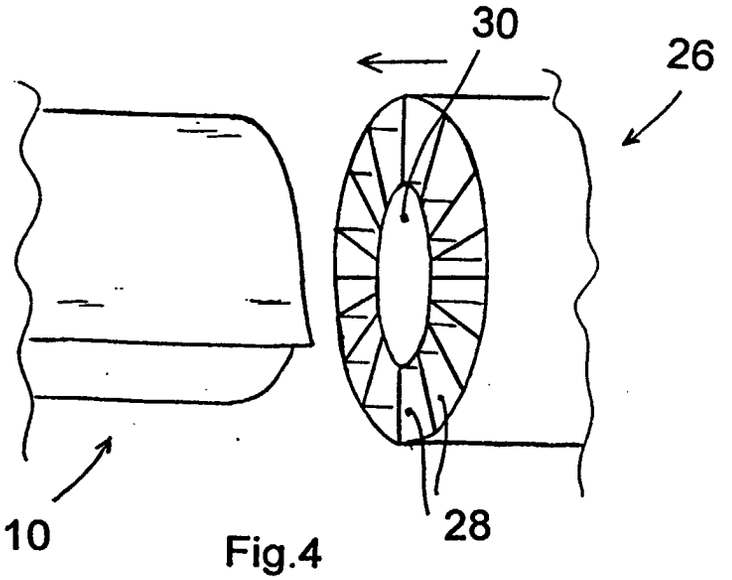

Fig.4