The invention relates to a pack of the folded carton type, that is to say a pack consisting of an outside carton and a lining inserted therein of sheet or foil type material, such as paper, plastic, metal foil or the like, the carton being capable of being closed by bending over at least two flaps provided on opposite side portions whilst the lining overlaps the flaps.

Packs of folded carton type consisting of a cardboard carton and a paper lining, which are closed by bending over the ends of the carton along transverse fold lines, are already known.

The closing of these familiar types of pack is difficult and time-consuming, either because the lining and the carton must be closed separately, or because difficulties arise from the thickness of the material, especially where the lining is secured to the closing flaps of the carton.

A type of pack is also already known in which the lining overlaps the closing flaps and is fastened to three adjacent connected closing parts. Only very thin cardboard—e.g. "chrome substitute board" or newspaper—can be used for such types of pack because if thick material, particularly corrugated cardboard, is used, closing becomes impossible or the lining is damaged owing to the stresses created, and thus air-tightness is impaired.

These disadvantages are avoided with the type of pack which is the subject of the invention, which can be made with equal advantage from material of varying thickness, particularly from thin material, without difficulties of any kind occurring when the pack is closed.

The type of pack described by the invention is distinguished from the types already familiar by two side portions of the lining being secured to adjacent closing flaps of the side portions of the carton for approximately the whole length of the closing flaps—so that when the closing flaps to which the lining is fixed are bent over, the lining lies with the two inside faces together and preferably, after these have been fastened together by gluing, bonding or the like, is bent over onto the outside surface of one of the closing flaps, whilst the points formed at the ends of the bent-over portions of the lining being fastened in transverse form to opposite flaps of the carton sides—so that by bending the flaps over upwards in a plane approximately at right angles to the side of the carton, the overlapping parts of the lining are once more brought with their inside faces together, and, again, preferably after having been fastened together by gluing, bonding or the like, are arranged in a plane vertical to the outside of the carton.

In the preferred form of the invention, the inner edge of the closing flap to which the lining is secured is arranged to reach almost to the centre of the carton in the closed position.

A particular feature of the invention, the fastening triangle can take the form of an isosceles triangle of height preferably approximately equal to that of the corresponding closing flap.

A pack of this kind can of course be supplied in the flat form to the consumer, but before he can begin to fill it, he must fasten—e.g. by welding or bonding—the overlapping parts of the lining to the bottom of the pack, and can only then fasten—e.g by gluing—the corresponding closing flaps.

It is however possible to save the user the fastening of the lining and still to send the pack out in flat form, if the closing flaps to which the fastening triangles are applied are provided with a fold line running along the top of the fastening triangle and continuing over the corresponding side wall of the carton to the opposite closing flap.

By a further feature of the invention, the lining can be secured with one inner face against the other, when the carton is closed at the bottom.

The process for producing a pack in accordance with the invention is characterised by two side portions of the lining which are fastened in triangular form to opposite flaps of the side portions of the carton, the flaps being then bent outwards in a plane approximately vertical to the sides of the carton, when the overlapping parts of the lining are again brought with one internal face against the other; the bonded seam so formed is then bent over into a plane vertical to the carton sides, following which the closing flaps to which the fastening triangles are applied are bent inwards and fastened; furthermore, the lining at the bottom of the carton can be bonded in the closed position and, after joining of the edges of the outer carton sides by gluing or the like, can be brought to the desired cubic shape by pressure on the side faces bearing the fold lines, the two outer flaps being then brought to the closed position and the top of the carton closed in the manner described.

It is possible also, however, to bond the carton lining at both ends and at any desired position of the bonded seam a piece of tubing or the like of plastic material or of a substance suitable for bonding can be bonded in, the inside wall of the tube being protected during the bonding process by a suitable insert. This tube can serve as a filling tube, and can be sealed up after the pack has been filled.

The lining may be of paper, parchment paper, or the like, and it is desirable to fasten it firmly—for example by gluing—to the carton sides. It is also possible to use papers or foils coated with plastic materials or suitable for hot sealing as linings. In this case, when the pack is being prepared, the lining seam can be heat sealed—i.e. air and moisture tight—before the outside folding carton is closed, whilst it can also be closed in the usual way by gluing. The arrangement of the lining makes it possible to close both the closing ends—i.e. the bottom and the top of the carton—in the same manner, in particular to seal them, or alternatively, to bond the lining when the carton is closed at the bottom, and thus obtain a hermetically-sealed pack.

The pack as contemplated by the invention is simple and cheap to produce and can be used with equal advantage to hold the most varied contents. Apart from materials in powder form, such as flour, salt, chemicals and the like it can also be used for materials in paste form such as mayonnaise, mustard, dough, or chemicals in paste form, artificial honey, jam, and salted fish, as well as for liquid materials of all kinds. In consequence of the materials used, the type of pack proposed by the invention is cheaper, for instance, than cans, which are mainly used for such materials. It also has the further advantage that it can be supplied to the user flat, i.e. in a manner which saves both space and transport charges. In addition, its weight is very small.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a plan view of the carton blank with the lining attached thereto shown in dot-dash lines;
Figure 2 is a plan view of the blank of Figure 1 folded in half; Figure 3 is a perspective view of the blank of Figure 2 opened into carton form; and Figure 4 is a perspective view of the carton of Figure 3 in partial flap closed form, and with a pouring spout fastened in the lining.

In the design of the carton according to this invention, as shown in Figures 1, 2 and 3, the walls 14, 15, 16 and 17 have vertical fold lines 101, 102, 103 and 104. By folding the walls along these fold lines, the edges 105 and 106 of the carton can be joined together by means of the adhesive tape 111 or the like to form another fold line 29. For closing this carton at the top, after the edges 105 and 106 have been joined together, sealing flaps 6, 7, 8 and 9 are provided, which are joined to the side walls 14, 15, 16 and 17 by fold lines 10, 11, 12 and 13, respectively. The composite side wall 14 is formed from the panels 14a and 14b when the carton is folded and edges 105 and 106 are joined together in fold line 29. In like manner, flap 6 is formed from the panels 6a and 6b and fold line 10 from segments 10a and 10b. The bottom of the pack is formed by corresponding closing flaps 6a, 7a, 8a and 9a which are separated from the side walls 14, 15, 16 and 17 by the fold lines 10a, 11a, 12a and 13a, respectively. The flap 6a consists of the parts 6a1 and 6a2, while the fold line 10a is composed of the segments 10a1 and 10a2. The closing flaps 6, 7, 8, and 9, as well as 6a, 7a, 8a and 9a, are overlapped along their respective edges by the extended marginal closing portions 18, 19, 20 and 21 and 18a, 19a, 20a and 21a of the one-piece lining. The closing portions 18a and 18a of the lining are made up of the parts 18a1 and 18a2 for the former and 18a3 and 18a4 for the latter. Edges 22 and 23 of the lining also project beyond the sides 14 and 14b, respectively. When the carton is folded over as in Figure 2, the edges 22 and 23 are glued or bonded together, innerface to innerface, in an air and watertight fashion. The closing flaps 7, 9, 7a and 9a are firmly secured, as by being glued over their entire insides inner face area to the corresponding vertically adjacent areas of the closing portions 19, 21, 19a and 21a, respectively, of the lining. The closing edges 18, 20, 18a and 20a, however, are fastened to the correspondingly adjacent closing flaps 6, 8, 6a and 8a, respectively, only over a triangular area common to both. There are four such triangularly shaped areas, 26a on half flaps 6a1 and 6a2, 26b2, 26b1 on flaps 6a and 26c on flap 6. Areas 26b and 26c, as readily seen in Figures 1 and 3, are each formed on a single flap, 8a and 8, respectively. Areas 26a and 26d, however, are each composed of two smaller triangular areas, 26a1 and 26a2 and 26b2 and 26c, respectively, Figures 1 and 3. The main body of the lining (not shown in the drawings) is glued, over all to the insides of the corresponding side walls of the carton against which it comes in contact.

Then, by folding the blank along fold line 28, as in Figure 2, another fold line 29 is created along carton edges 105 and 106 which have been thus joined together. Lining edges 22 and 23, which now protrude through and along fold line 29 are bonded together, innerface to innerface, and further folded over either edge 105 and 106, Figure 2. A strip of adhesive tape 111, for example, is applied over the once-folded edges 22/23 to fasten it to panel 14. Figure 3, the closing flaps 19a, 20a, 20a and 21a of the lining protruding at the bottom of the pack are also bonded together, innerface to innerface, so that the insides of parts 18a1 and 19a are bonded to the insides of parts 18a2 and 21a, respectively, and the one-half portion of part 20a that is adjacent to part 19a is bonded, innerface to innerface, to the one-half portion of part 20a that is adjacent to part 21a.

Before use, it is only necessary to convert the flattened carton assembled in this way into its appropriate three-dimensional form by simultaneously pressing on the fold lines 28 and 29. Then, the closing flaps 7a and 9a adjacent to the flaps 6a and 8a with the fastening triangular areas thereon automatically assume the closed three-dimensional figure, Figure 3, so that only the flaps 6a and 8a with the fastening triangular areas need to be bent over and fastened, as by adhesive tape (not shown), and the carton is then ready to be filled.

After being filled, the pack is closed by bending over outwards the opposite pair of flaps 6 and 8 with the fastening triangles thereon into a plane more or less at right angles to the carton walls, whereupon the lining is brought together with one inside face 19a—19b—20 against the other 19b—21a—20 and can be bonded together, innerface to innerface. The bonded seam thus formed is then bent over onto the outside of one closing flap 7 or 9 and the other flaps 6 and 8 with the fastening triangles are then bent over inwards and closed, for example, by the usual adhesive sealing tape.

The use of impermeable material as the inner lining, such as plastic-coated paper, makes the carton air and watertight. It can be cheaply produced since the outside carton can consist of flat or corrugated cardboard or the like.

The carton which is the subject of this invention can be used to good advantage in large scale packing operations.

In Figure 4, a plastic tube 30 has been welded into the top sealing seam of the lining and constitutes a variation in the construction of the carton design shown in Figures 1, 2, and 3.

Having now described the means by which the objects of the invention are obtained, we claim:

A carton comprising an end wall subdivided by a fold line into two first half end walls, two side walls each being joined by a fold line to one of the half end walls, respectively, two free edges half end walls each joined by fold lines, respectively, to a side wall, top and bottom closing flaps joined to each wall, respectively, a water impermeable liner secured to the walls and flaps and extending outwards of the flap and the free edge half end walls, said carton being folded double on the fold line between said first half end walls, the edges of each liner adjacent said free edge half end walls being glued together and the free edges of said free edge half end walls being secured together to form a flat blank, said blank being openable into a rectangular tube by pressing the secured joint and the folded edge together, and said flaps and liner portions glued thereto being closable in overlapping sealed relation to form a watertight carton.

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