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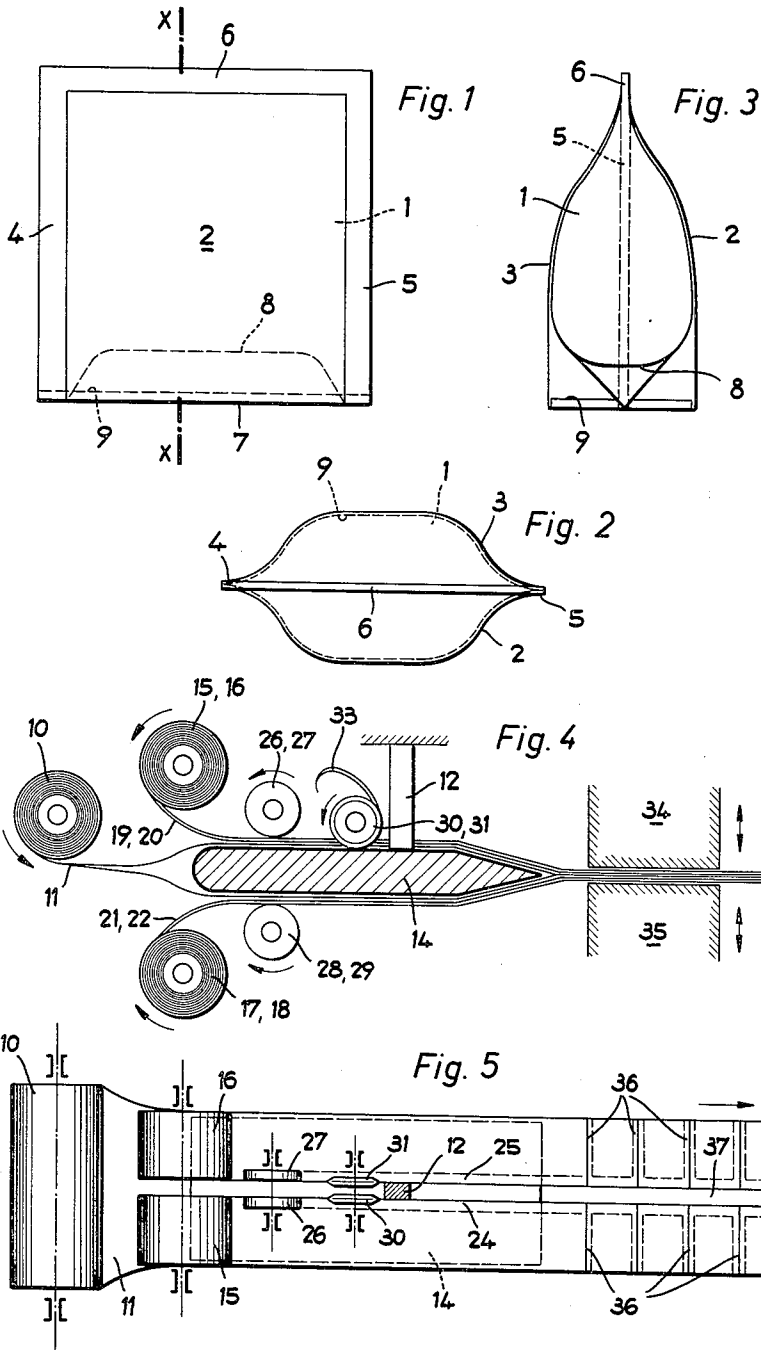
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FLAT BAG PACKAGE AND METHOD FOR FABRICATING SAME

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FLAT BAG PACKAGE AND METHOD FOR FABRICATING SAME

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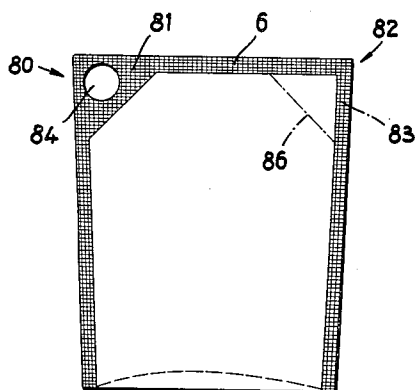


Fig. 3a

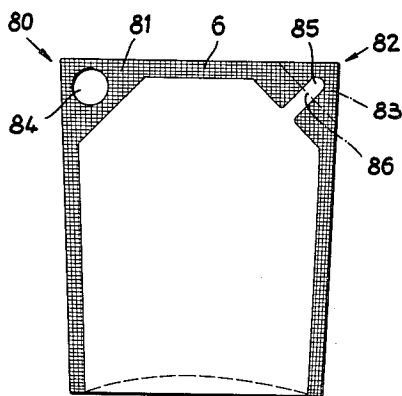


Fig. 3b

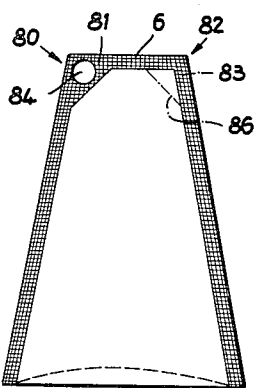


Fig. 3c

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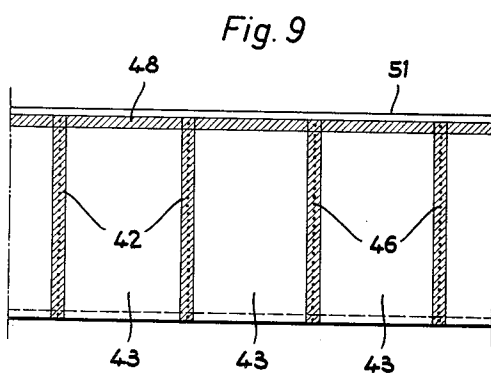
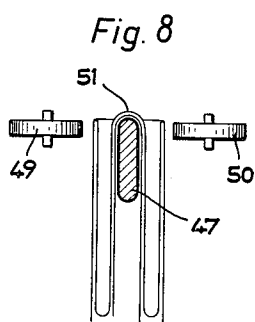
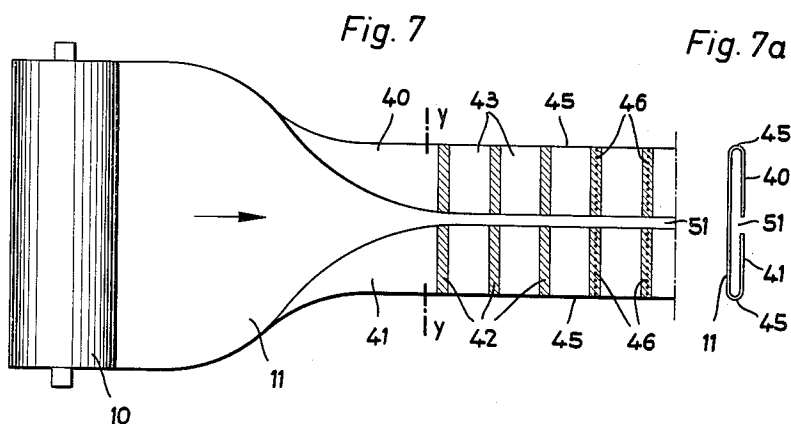
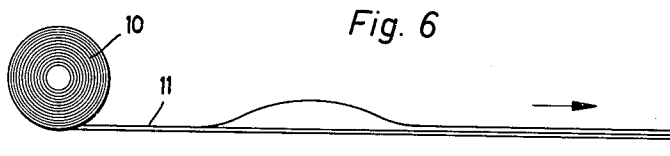
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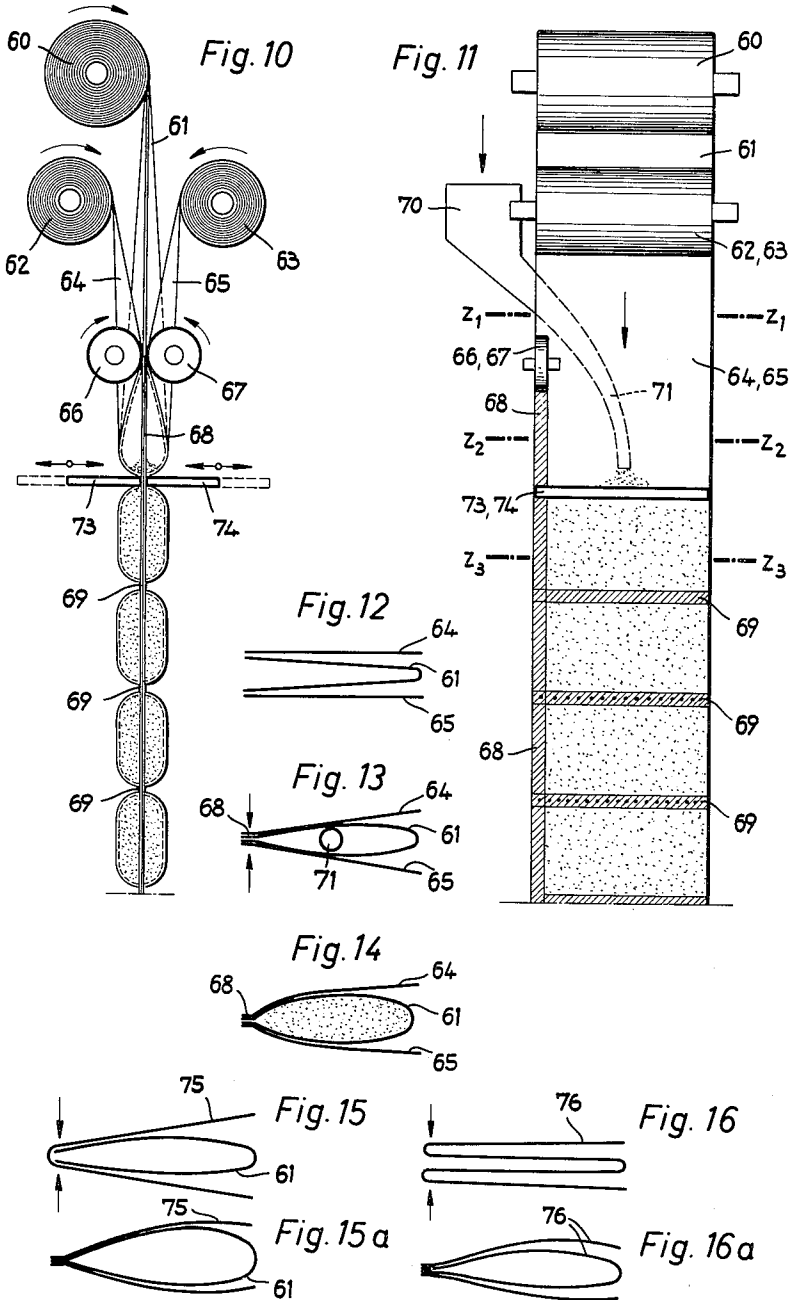
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**FLAT BAG PACKAGE AND METHOD
FOR FABRICATING SAME**

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1 Claim. (Cl. 229—55)

There are many and various forms of flat bag and methods of fabricating them. Such bags are used as utility packages for receiving most dry, powdered or even granular commodities. Despite the fact that there are impermeable plastic foils, the use of flat bags for packaging moist or liquid commodities is attended by the unfortunate disadvantage that such flat bag packages are, on account of their cushion-like form, liable to burst at jointing or closure seams by pressure exerted on the surfaces of the bag, particularly where a plurality of them are stacked one on another, or to be damaged for other causes, with the result that their contents escape or evaporate. Thus, special steps have to be taken to safeguard flat bags, and particularly those of thin-walled foil material with connecting means, against over-strain, particularly in the case of the packaging of liquid or semi-liquid materials.

The object of the invention is to provide a flat bag package which gives protection in a very effective fashion. For this purpose, the bag package devised by this invention comprises the combination of a flat bag of preferably thin-walled, yielding and, if desired, transparent foil material for receiving the commodities to be packaged, together with a protective cover enclosing this flat bag, which cover will preferably be of a material which is stronger and more rigid than that of the flat bag, the bag and cover being assembled with the cover firmly and appropriately connected to part only of the margin of the flat bag and freely surrounding the remainder of the flat bag as a shielding hollow body, more or less of the shape of the bag. It is within the scope of the invention to shield a plurality of individual flat bags against external effects by a protective cover of this nature. The flat bag and the protective cover can be connected in any desired and suitable fashion, for instance by adhesive, welding or heat sealing.

The constructional unit in accordance with the invention, comprising the flat bag and the protective cover, gives a flat bag package in which the loads or stresses exerted on the bag may be sustained and diverted to the cover when the bag is filled.

To prevent additional stresses on the flat bag being set up inside the protective cover, provision is made, in accordance with a further feature of the invention, to allow for a certain amount of relative movement of the flat bag within the protective cover by firmly attaching the protective cover and the bag together merely at the top or mouth of the bag, and at the lateral margins of the bag, the bottom and the side walls of the flat bag being, in contrast, displaceable within the protective cover.

In a preferred embodiment of the invention, the flat bag package is such that, when it is filled, the protective cover has substantially the shape of a stably standing hollow body, for example is of bell-form.

In this event it is prescribed that the bottom of the filled flat bag shall assume a position which is positively spaced from the lower rim of the downwardly-open, standing hollow body or cover. A form of protective cover of this nature very ably ensures practically complete shielding of the enveloped flat bag from external effects,

both during the standing or transport of the package. In accordance with a further feature of the invention, an additional reinforcement of the hollow body is secured by marginally stiffening the lower rim of the downwardly-open protective cover hollow body, preferably by turning up a flange thereof.

A further substantial advantage of the package according to the present invention resides in the fact that it can stably stand and is therefore particularly suitable for packaging liquid and semi-liquid commodities.

A flat bag package according to the invention can, as desired, be made of a common material or different materials. Thus the flat bag can be made of thin foil and the protective cover of thick foil, pasteboard, paper or the like. It is often satisfactory to use the same or similar materials for both items of the package, for the purpose of simplifying the fabrication, and where the form and contents of the flat bag allow for an external shield of less strength. Preferably, however, the flat bag according to the invention is made of weldable or heat sealable foil, for example of plastic such as polyethylene, or a foil which is provided with a weldable or heat sealable coating, and the protective cover is made of a relatively stiff material, such as paper, cardboard, metal foil or the like. It is also possible, and provided for in this invention, to use weldable packaging material both for the actual flat bag and for the protective cover. This enables the flat bag to be connected to the protective cover in very simple and effective fashion by welding or heat sealing.

A particular feature of a package according to the invention involves the oblique sealing of one or both upper corners of the package, in such a way that the welding seam forms a triangular surface sealed area at this or these parts. An aperture may be formed in one or more of these triangular surfaces to enable the filled package to be packed very compactly by suspension, or to provide a special visible surface, where a number of packages are suspended for display purposes. The triangular sealed area, being of increased strength, also provides security in the suspension of the filled packages. Furthermore, if the aforesaid aperture is sufficiently large, the package can be hooked to a finger of the hand without pressure being exerted on the filled package, which is an advantage when, for instance, an open package is to be moved or emptied.

It may be of particular advantage, and assisting the emptying of a package, to provide in a triangular sealed area a channel which is, preferably, directed towards the apex of the corner and terminates shortly before the outer edge of the package, which channel is opened by separation of the corner concerned. This ensures a facile emptying of the contents of the package, for example in the case of liquids by a small tube or straw poked into the channel. A further advantage in this construction is that the mouth of the channel represents, in practice, the highest point of the filled zone, so that the contents do not run out on opening of the package.

In a preferred method according to the invention for fabricating flat bag packages of the form stated, a continuous tube of foil material used for fabricating the flat bags is drawn over a plate-form body which determines the shape of the bags, and during this operation, the foil tube is covered at two opposite sides of this body with strips of material to form the protective covers and means connecting the foil tube and the cover strips are formed at the two sides of the mouth of the bag, whereupon in a subsequent operation the lateral seams of the packages are formed, and finally the individual packages are separated by a transverse cut into or between these lateral seams.

Again, the material used for the protective cover strips

may be stiffer than the foil material used for the flat bag, without the invention being, however, limited to this feature. The formation of the connecting seams is, again, very simply performed when weldable or heat-sealable materials are used, or materials which are provided with a weldable or heat-sealable coating.

To provide for particularly advantageous fabrication of the flat bag packages according to the invention, a further feature of the latter lies in a method of simultaneously fabricating a double row of the flat bag packages, in which the endless foil tube drawn over the plate-like body is covered on each of the two said opposite sides of this body with two strips of the material used to form the protective cover, these two protective cover strips at each side being spaced to leave a central strip of the foil tube free and exposed, longitudinal seams are then formed at the two sides of each free central strip of foil tube along the confronting margins of the pair of protective cover strips to connecting the latter to the foil, whereupon the central strip of this foil tube between the protective cover strips is separated at one side only of the tube leaving a double row of flat bag packages attached together at the other side of the foil tube, the lateral seams of the individual packages are formed transversely of the longitudinal seams, the resulting individual packages are separated from one another by a cut between or along the said side seams and, after the individual packages have been filled, these latter are separated from the connecting central strip of the foil tube.

A further advantageous method for the simultaneous fabrication of a double row of flat bag packages according to this invention is characterized by the fact that a foil tube fed from a reel, and preferably of a transparent and weldable or heat-sealable plastic such as polyethylene, or a material coated with such a weldable or heat sealable material, is folded by doubling over the two longitudinal sides on to its medial axis to first form two continuous pockets, and that two rows of attached double-walled flat bags are produced from these pockets by means of connecting seams, preferably welding or heat-sealing seams, extending transversely to said medial axis, the outer walls of these flat bags becoming protective and supporting covers, which enclose the respective flat bags in bell-fashion when these bags are filled out, cutting or separating the outer folded edges.

To increase the stability of the individual bags, reinforcing strips, e.g. of metal foil, pasteboard or the like, may be introduced between the walls of the folded bag and the sides of the protective and suspending cover. Such strips may also be printed for commercial purposes, or to give instructions for use.

A further method of the invention for producing a row of flat bag packages of the kind of this invention is characterised by the fact that there is formed from a running reel of strips of weldable or heat sealable packaging material a flat oval tube for receiving the filling material, this is covered at its two opposite sides by protective cover strips and connected to the same by a common, outer marginal seam, a quantity of the commodity to be packaged is charged into this flat tube, and filled bag packages individually surrounded by a bell-like protective cover are produced by further connecting seams disposed transverse to the longitudinal axis of the tube and connecting the walls of the latter to one another and also to the cover strips.

Preferably, in accordance with the invention, the strips of packaging material used to produce the flat oval tube are of weldable or heat sealable packaging material, e.g. polyethylene or the like and, before seaming, are brought into the form of a two-layer strip folded into V-shape in cross section, the free longitudinal edges of the folded laminated strip being connected together, and in each case with a longitudinal margin of the two protective cover strips by an outer welding or heat sealing seam.

It is possible for the formation of the sides of the protective cover to feed in a strip folded in V-shape or, for forming the oval flat tube and the protective cover, to feed in a single strip folded in W-shape, the folding tube being formed out of the two inner limbs thereof and the sides of the protective cover from the two outer limbs.

Reference will now be made to embodiments of flat bag package according to this invention in relation to the accompanying diagrammatic illustrations which will also serve to explain the performance of methods according to the invention for the fabrication of these packages, it being understood that the invention is not limited to these particular examples.

FIGURES 1 to 3 illustrate a preferred embodiment of a flat bag package according to the invention, respectively in side view, plan and cross section on the line X—X of FIGURE 1.

FIGURES 3a, 3b and 3c are side views of further embodiments of flat bag packages according to the invention.

FIGURES 4 and 5 are respectively diagrammatic side and plan views, with parts in section, illustrating the performance of a method according to the invention for producing a double row of flat bag packages.

FIGURES 6 and 7 are a side view and a plan view giving a diagrammatic illustration of a further method of fabricating a double row of flat bag packages in accordance with the invention.

FIGURE 7a is a section on the line y—y of FIGURE 7. FIGURE 8 illustrates, partly in section and diagrammatically, means for filling and simultaneously closing the double row of flat bags formed in accordance with FIGURES 6 and 7.

FIGURE 9 is a side view corresponding to FIGURE 8, omitting the means for closing the packages after they have been filled.

FIGURES 10 and 11 are respectively a side and a plan view of the system used in a further method of producing a series of flat bag packages in accordance with the invention.

FIGURES 12, 13 and 14 are diagrammatic sections on the lines z_1 and z_1 , z_2 — z_2 and z_3 — z_3 of FIGURE 11.

FIGURES 15, 15a, 16 and 16a illustrate, again in diagrammatic section, various starting shapes for the combination, in accordance with this invention, of flat bag foils with associated cover foils or cover strips, FIGURES 15a and 16a illustrating the filled condition.

In the flat bag package illustrated in FIGURES 1 to 3, the flat bag 1, which is pre-formed with a seamless bottom by superimposing the side edges, one on another, and is made of thin, weldable or heat-sealable foil, is connected to the two sides 2 and 3 of a protective cover by welding together the lateral margins 4 and 5 of the bag and the cover. The seamless bottom 8 of the flat bag 1 is connected to the cover sides 2 and 3 at the two lateral margins 4 and 5 only. In making the top or closure seam of the package, only one margin of the folding bag is first, in each case, welded to the corresponding and associated margin of the protective cover, such that the complete filling opening of the bag package remains open for charging purposes. When the filling is complete, this seam 6 is also closed by welding.

During the filling and the closure of the top or closure seam 6, the bellying-out of the bag produces a protective cover in the shape of a bell or the like, the surfaces 2 and 3 of the protective cover freely surrounding the outer faces of the flat bag 1, and major part of the bottom 8 of this bag being raised a certain amount above the bottom edge 7 of the protective cover 2, 3 (see FIGURES 1 and 3). Thus, only the side seams 4, 5 and the top seams 6 of the flat bag 1 and the protective cover 2, 3 are connected together, whilst the side faces of the bag 1 and the bottom 8 thereof largely hang free and movable inside the bell-like cover 2, 3.

To ensure that this will stand stably on a surface it

may be flanged, as at 9, for stiffening purposes. The shape of bag and protective cover illustrated may be varied as desired.

In the embodiment illustrated in FIGURES 3a, 3b and 3c, at least one upper corner 80 is sealed off obliquely so that the welding seam 6 forms at this part a form of triangular surface 81. The other upper corner 82 can easily be furnished with a similar triangular surface 83. One or both triangular surfaces 81, 83 may have an aperture 84 for the engagement, suspension or handling of empty or filled packages; in the drawings an aperture has only been shown incorporated in the corner 80.

In FIGURE 3b, the upper corner 82 of the package has, instead of an aperture, a duct 85, which runs towards the apex of this corner, and terminates shortly before the outer edge of the package at the corner.

FIGURE 3c indicates that a package according to the invention may be of upwardly tapered form.

To empty the package, a cut need only be made at 86, and this produces an adequate opening for the complete discharge of the contents of the package. In the embodiment of FIGURE 3b, the severing cut 86 is made through the duct 85.

FIGURES 4 and 5 diagrammatically illustrate the way in which a double row of flat bag packages according to FIGURES 1 to 3 can be formed by mass-production methods.

A continuous or endless tube 11, made from a thin and weldable foil strip, for example of polyethylene, is drawn from a reel 10 smoothly over a shaping body 14 which is mounted in freely-floating fashion on a bar 12. Double rollers 26, 27 and 28, 29 are arranged respectively at the upper and lower sides of the body 14, these being in the form of welding rollers and serving to unite to the foil tube 11 strips 19, 20 and 21, 22, which run off supply reels 15, 16 and 17, 18 respectively and are used to form the protective cover.

The connection is, however, only made at the margins 24 and 25 of the protective cover strips, leaving central strips 33, 37 of the foil tube 11 free and exposed between these margins 24, 25 at the upper and lower sides of the body 14. One of these central foil tube strips, for example the upper strip 33, is continuously separated by cutting wheels 30, 31 (see FIGURE 4), so that the parts of the material which are welded together at the margins 24, 25 are left held together only by the central strip 37 of the foil tube 11 running along the underside of body 14.

The packaging strips so prepared then run between welding jaws 34, 35 which weld together the lateral margins 4, 5. The two rows of flat bag packages formed in this way are separated from one another between the margins 4, 5 by stamped perforations 36, so that the individual packages can be filled still attached or after preliminary separation, and the filling openings then closed by the seam 6.

In the method according to the invention illustrated in FIGURES 6 to 9, a foil tube 11, preferably of a transparent, weldable or heat-sealable plastic such as polyethylene, as is commercially well known as lay-flat tubing, is withdrawn flat from a supply reel 10. Two continuous double-walled pockets 40, 41 are first formed by turning over the two longitudinal margins of this foil tube 11, and from these a double row of flat bags 43 is formed by means of welding seams 42 transverse to the longitudinal axis of the tube 11. The filling openings of the bags 43 are arranged along the medial axis of the foil tube 11 at specific intervals (see FIGURES 7 and 7a).

After the cutting off or separation of the outer tubular parts of the folding edges 45, this forms the protective covers for the flat bags which, as illustrated in FIGURES 1 to 3, are distended into bell-like shape after filling of the individual bags.

Where the foil material is very thin, to increase the rigidity of the two parts enclosing the flat bags, strips of metal foil cardboard or the like may be introduced into

the spaces between the wall of the bag and the surface of the protective and suspending cover at the two sides. Such strips may be printed to indicate the contents or the origin of the goods.

The packages can be filled either by successively charging the rows of these packages, still attached, and the individual packages then separated from one another and from the central strip 51 to the individual bags may be separated along the punch lines or perforations 46 before charging. Again it is optional whether the central strip 51 of the tubular foil 11 is first left to hold the individual packets 46 together as a set, or whether it is separated from the individual packages before the filling is performed.

FIGURES 8 and 9 illustrate the way in which the rows of flat bags of the longitudinal pockets 40, 41 may be simultaneously filled and closed. The rows of bags are hung and drawn, with the filling openings upwards, over a bar 47 and the closure seams 48 closed by welding rollers 49, 50 after filling.

In the method of fabricating a row of flat bag packages in accordance with the invention, diagrammatically illustrated by FIGURES 10 to 14, a double layer strip 61 of the material for forming the flat bags, folded into V-shape, runs from a reel 60. This material preferably comprises weldable or heat-sealable polyethylene. Strips 64, 65 unwound from reels 62, 63 are applied against the outer faces of this strip 61 (see the illustration in FIGURE 12 of the section z_1-z_1 of FIGURE 11).

The composite strips 61, 64, 65 formed in this way then run under a pair of welding rollers 66, 67, which join together the free margins of the said strips, as illustrated at the left hand side of FIGURE 13 at 68, so as to form an oval tube which has cover strips extending outwards from both sides (see FIGURE 13, i.e. the section on line z_2-z_2 of FIGURE 11).

The oval tube formed in this way can now be filled continuously or stepwise by a feed hopper 70, the funnel 71 of which projects into the tube 61, before it is closed, above the welding rollers 66, 67 and extends approximately to a pair of welding jaws 73, 74 which forms the transverse seam 69 at regular intervals. The walls of the tube 61 are firmly welded by these transverse seams 69 both with one another and also with the cover strips 64, 65, thereby forming a series of covered stably-standing bag packages which can be separated into the required number of pieces by perforation or cutting along the transverse seams 69.

As can be seen from FIGURES 15 and 15a, instead of using two separate cover strips 64, 65, use may be made of a single V-form strip 75 which covers the V-form strip 61 of material for the flat bags at the two open edges of the latter.

In FIGURES 16 and 16a, a single strip 76 folded into the shape of a W is used to fabricate the packaging strip in accordance with the invention. The production and filling of the row of packages formed from the strips of FIGURES 15, 15a and 16, 16a will be immediately obvious to a technician from the preceding explanation, and does not need to be pointed out in more detail.

I claim:

A bag unit comprising, in combination, a flat bag of sheet material, a commodity in said bag, said bag including lateral margins, a protective bell-like cover surrounding said flat bag and forming a stably-standing hollow body open at the bottom and connected with the flat bag only at an upper seam and at said lateral margins, the protective bell-like cover being of a stiffer material than the flat bag, the upper seam terminating at one end in a triangular sealed area provided with an aperture, the upper seam further terminating at its other end in a triangular sealed area having therein a channel extending from the interior of the flat bag towards the apex of a corner of said bag.

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