United States Patent

[11] 3,596,824

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[21] Appl. No. **882,392**
[22] Filed **Dec. 3, 1969**
Division of Ser. No. 739,559, June 24, 1968.
[45] Patented **Aug. 3, 1971**
[32] Priority **July 1, 1967, July 28, 1967**
[33] **Germany**
[31] **L 56 890 and L 57 096**

[54] **CARRIER BAGS**
11 Claims, 27 Drawing Figs.

[52] **U.S. Cl.** **229/54, 229/55**
[51] **Int. Cl.** **B65d 33/02, B65d 33/08**
[50] **Field of Search** 229/54, 63, 55

[56] **References Cited**

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Primary Examiner—David M. Bockenek
Attorneys—Holman, Glascock, Downing and Seebold and Holman & Stern

ABSTRACT: A synthetic thermoplastic carrier bag which consists of a doubled over thermoplastic sheet forming both faces and bottom of the bag. The edges of the sheet are longitudinally welded together to form the bag container, and there exists a reinforced upper portion around the open periphery of the bag, which portion is at least two layers thick. The leading edges of the upper peripheral portion is formed by a doubled over layer of material, and a grip aperture is formed in each face.

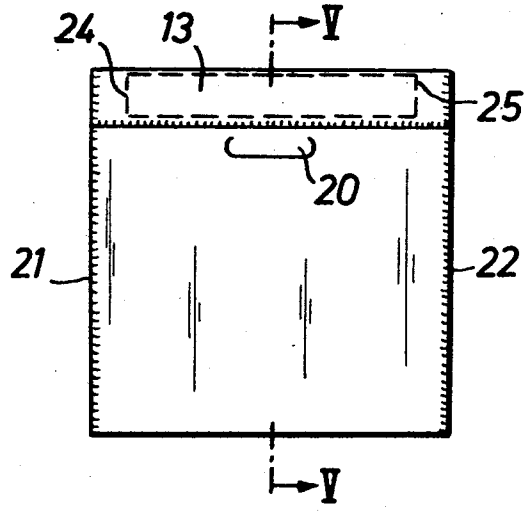


FIG.1

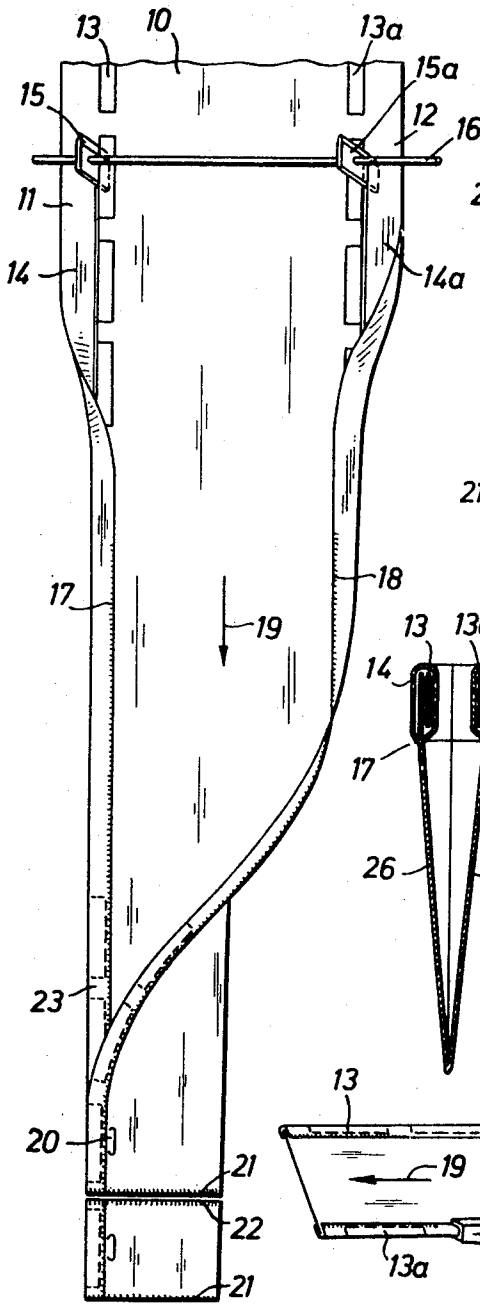


FIG.3

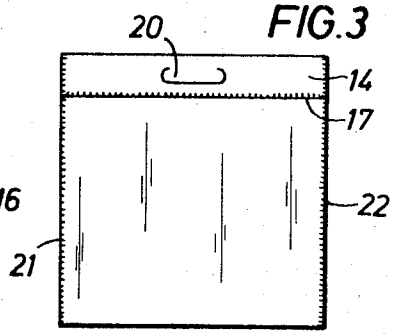


FIG.4

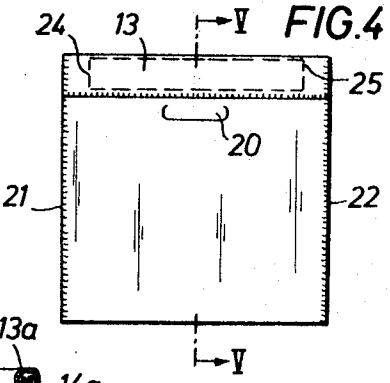
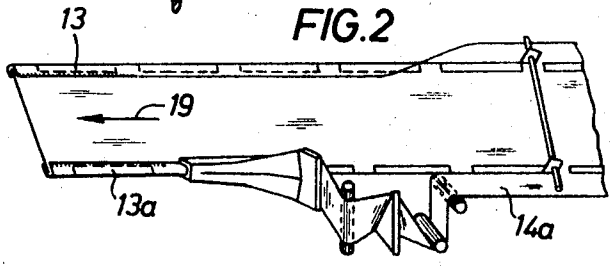


FIG.5

FIG.2



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FIG.6

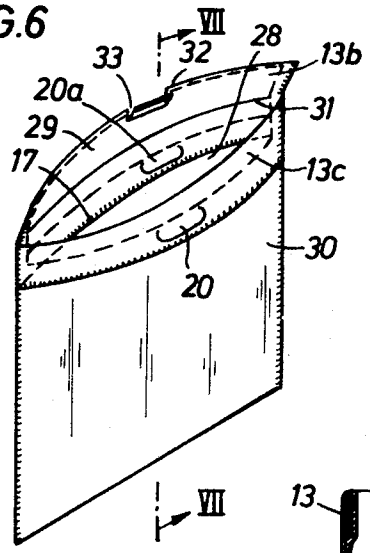
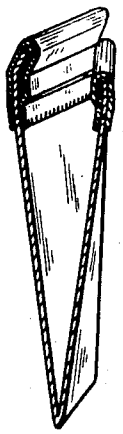


FIG.7



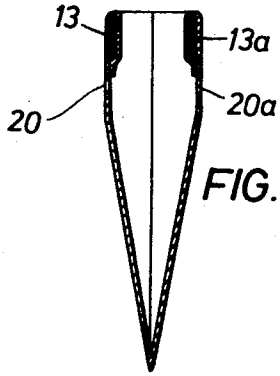


FIG.8

FIG.9

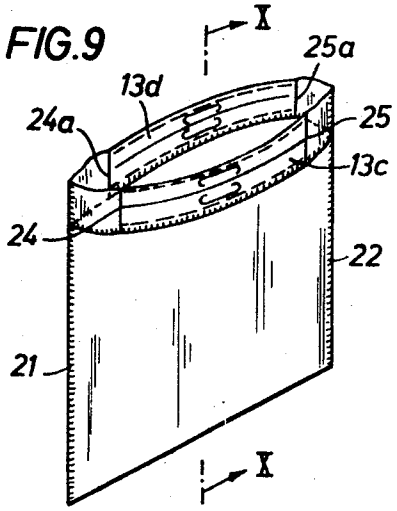
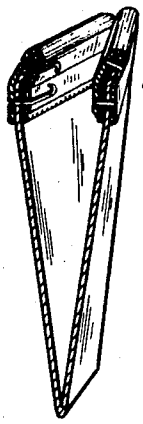


FIG.10



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FIG.11

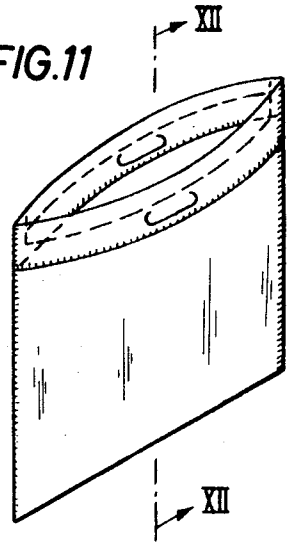


FIG.12

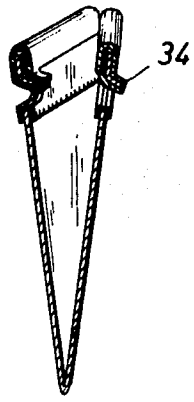


FIG.13

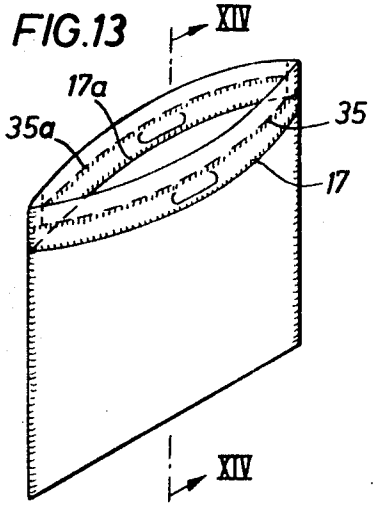
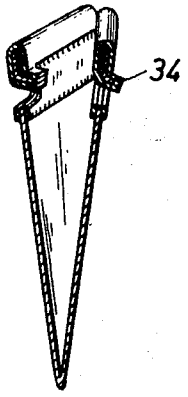


FIG.14



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FIG.15

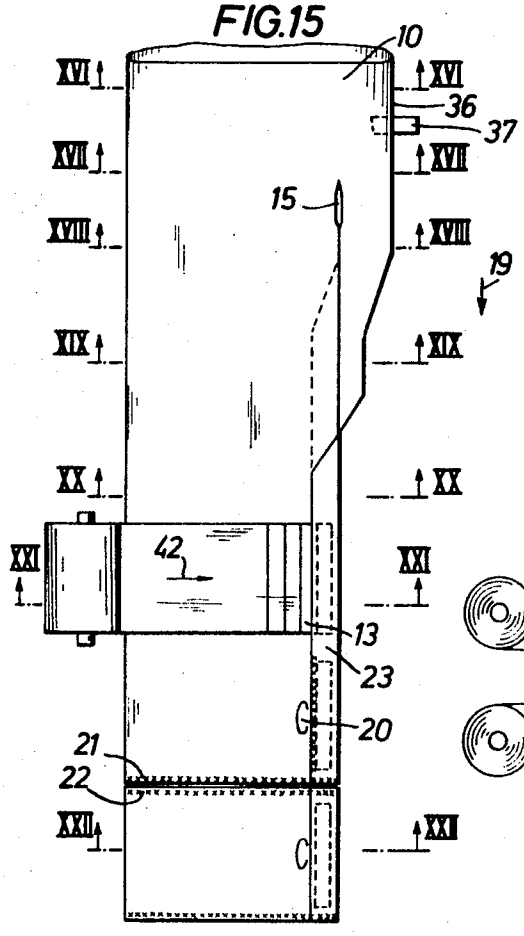


FIG.16

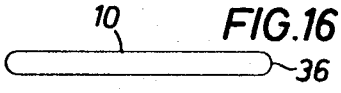


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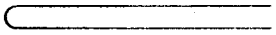


FIG.18

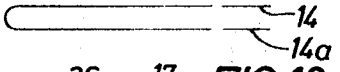


FIG.19

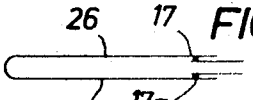


FIG.20

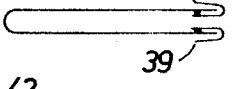


FIG.21

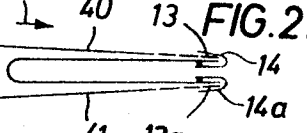


FIG.22

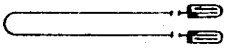


FIG.23

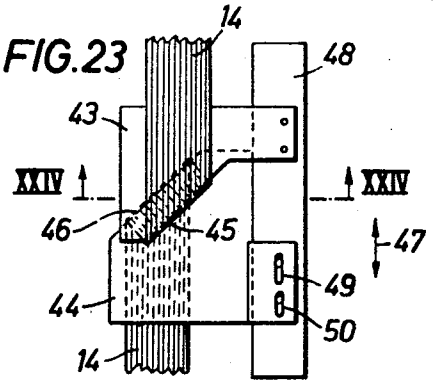
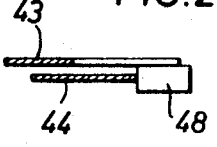


FIG.24



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FIG. 25

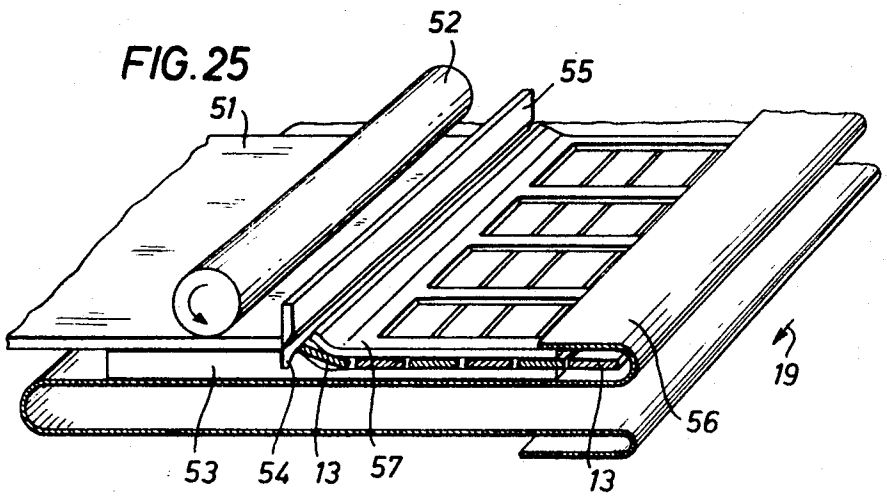


FIG. 26

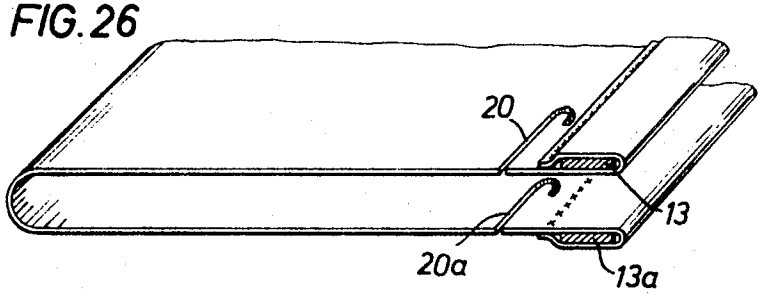
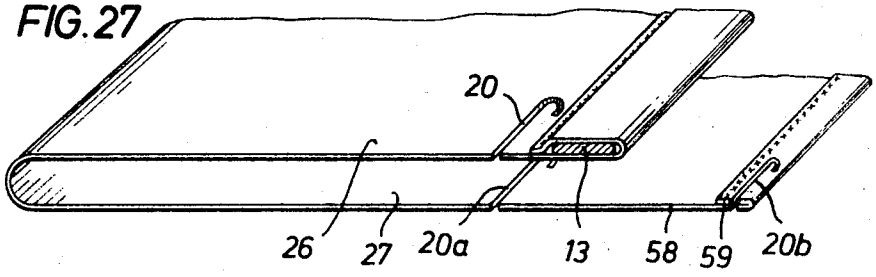


FIG. 27



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CARRIER BAGS

This is a division of Application Ser. No. 739,559, filed June 24, 1968.

It is already known to provide carrier bags with reinforcements at their open upper edge. These reinforcements in the form of strips from cardboard are either glued on or it is used as cardboard coated with a synthetic thermoplastic material so that it may likewise be affixed by welding to a carrier bag by the application of pressure and heat. Normally, these reinforcements of the open upper edge are applied after manufacture of the carrier bag. In the hitherto known carrier bags, also reinforcing inserts are affixed to the carrier bag by welding or pasting. Besides these reinforcing inserts from cardboard or stiff synthetic thermoplastic foil, it has also been proposed to affix reinforcing strips from synthetic thermoplastic foils by welding, these reinforcing strips consisting of a synthetic thermoplastic material which is different from that of the carrier bag. Special delivery spools for the reinforcing strips are therefore necessary which have to be continuously exchanged on the production machine as soon as they are exhausted. The production machine necessitates besides the structural design a considerable wasting of time.

The instant invention flowed from the problem of providing carrier bags which may be produced by very simple means and require no reinforcing strips obtained from a special foil. Besides the reinforcement of the upper edge of the carrier bag by reinforcing strips from a synthetic thermoplastic foil, the carrier bags shall further be provided with reinforcing inserts so that they have a particularly high carrier strength.

The present invention flows especially from the problem of producing carrier bags with reinforcements of the upper gripping edge which are provided with punched out grip apertures and which can be mechanically produced in a particularly simple manner. The main object is to provide a synthetic thermoplastic carrier bag of simple construction having a reinforced upper portion around the open periphery containing grip apertures.

In a method for producing such a carrier bag from synthetic thermoplastic foil with a reinforcement at the upper edge of the carrier bag and with punched out grip apertures passing through both walls of the carrier bag, it is proposed that the two edges of the foil band are continuously folded towards the outside and the edges of the folds are affixed to the foil band by welding, whereupon the grip apertures are punched out and finally transverse closure welds with an intermediate separating out are effected for separating the finished carrier bag from the foil band.

As particularly advantageous it is proposed that by continuous cutting at the edges of the foil band strips are separated which subsequently are folded in a U-shaped manner and are then slid over the new edge of the foil band formed by such continuous cutting. The new edge is engaged with the folded U-shaped foil strips up to the folding line of the foil band whereupon the grip apertures are punched out, and finally transverse closure welds with an intermediate separating cut are effected for separating the finished carrier bag from the foil band.

There is additionally provided between the walls of the carrier bag and the reinforcing strips at the open upper edge a reinforcing insert which is not affixed to the foils by welding. The material for these reinforcing inserts may therefore be various stiff materials since their weldability with the foil is not important.

In the drawings are illustrated, by way of example, several embodiments of the invention. The same is however not limited to the illustrated embodiments so that further modifications may be made within the scope of the invention.

FIG. 1 is a top view and perspective illustration of the method for producing of carrier bags with reinforcing strips and additional reinforcing inserts;

FIG. 2 is a perspective illustration of a folding device;

FIG. 3 is a side view of a carrier bag with reinforcing strips;

FIG. 4 is a side view of a carrier bag with reinforcing strips and reinforcing inserts;

FIG. 5 is a longitudinal section on the line V–V of FIG. 4;

FIG. 6 is a perspective view of a carrier bag made from textile material;

FIG. 7 is a longitudinal section on the line VII–VII of FIG. 6;

FIG. 8 is a longitudinal section of a modified carrier bag;

FIG. 9 is a perspective view of a further carrier bag from textile material;

FIG. 10 is a longitudinal section on the line X–X of FIG. 9;

FIG. 11 is a perspective view of another modified carrier bag;

FIG. 12 is a longitudinal section on the line XII–XII of FIG. 11;

FIG. 13 is a perspective view of a further modified carrier bag;

FIG. 14 is a longitudinal section on the line XIV–XIV of FIG. 13;

FIG. 15 shows in a top view and in essentially diagrammatic manner the production of carrier bags, starting from a hose of synthetic thermoplastic material;

FIG. 16 shows the hose in cross section on the line XVI–XVI of FIG. 15;

FIG. 17 shows the half-hose in cross section on the line XVII–XVII of FIG. 15;

FIG. 18 shows the half-hose in cross section on the line XVIII–XVIII of FIG. 15;

FIG. 19 shows the carrier bag in cross section on the line XIX–XIX of FIG. 15;

FIG. 20 shows the carrier bag in cross section on the line XX–XX of FIG. 15;

FIG. 21 shows the carrier bag in cross section on the line XXI–XXI of FIG. 15;

FIG. 22 shows the carrier bag in cross section on the line XXII–XXII of FIG. 15;

FIG. 23 is a top view of the device for insertion of a reinforcing insert into the reinforcing strip separated from the edge of the half-hose;

FIG. 24 is a vertical section on the line XXIV–XXIV of FIG. 23;

FIG. 25 shows on a larger scale and in perspective illustration the device for separating and supplying the reinforcing inserts into the space between the outer wall of the half-hose and the fold formed for the reinforcement thereof;

FIG. 26 is in partial view and perspective illustration of another carrier bag according to the invention; and

FIG. 27 is in partial view and perspective illustration of a modified carrier bag with an overlapping cover.

FIG. 1 shows a flat band 10 made from synthetic thermoplastic material which is preferably printed. Within the edges 11, 12 and at a distance therefrom are continuously applied reinforcing inserts 13, 13*a* which have a predetermined length and a predetermined width. The length and width of these reinforcing inserts 13, 13*a* depend on the kind of carrier bag to be produced. According to FIG. 1, the reinforcing inserts 13, 13*a* are applied at a distance from the above-mentioned edges 11, 12 of a flat band which corresponds at least to their double width, since in this illustrated embodiment, there are to be separated foil strips 14, 14*a* at both edges of the band. For this purpose there is provided two cutters 15, 15*a* which are fixed to a crossbar 16 extending transverse to the foil band 10 in such a manner that their lateral distance from one another may be adjusted. The cuts for separating the foil strips 14, 14*a* are carried out immediately adjacent to the outer edges of the reinforcing inserts 13, 13*a*. The foil strips 14, 14*a* so formed are continuously folded along their median longitudinal axis in a U-shaped manner and slid over the edge of the foil band provided with the reinforcing inserts. Thereupon the edges of strips 14, 14*a* are connected with the upper and lower side of foil band 10 by longitudinal welds 17 and 18. The foil band 10 moved in the direction of arrow 19 is then folded along its median longitudinal axis to obtain a half-hose. In this half-hose are punched out the grip apertures 20,

preferably below the reinforcement. The grip apertures may however pass through the reinforcing strips **14**, **14***a* and the reinforcing inserts **13**, **13***a*. Finally are effected transverse closure welds **21**, **22** with an intermediate separating cut for separating the finished carrier bag from the half-hose. These transverse closure welds **21**, **22** with the intermediate separating cut are arranged in the gaps **23** between the reinforcing inserts **13**, **13***a*. As is shown in FIG. **4**, the lateral edges **24**, **25** of the reinforcing insert **13** are therefore spaced from the transverse closure welds **21**, **22**.

The reinforcing inserts **13**, **13***a* may also be omitted since in many cases a sufficient reinforcement of the gripping edge is already obtained by the U-shaped reinforcing strips **14**, **14***a*. This is shown by the carrier bag of FIG. **3** in which the grip apertures **20** are punched out in the reinforcement.

FIG. **5** shows a longitudinal section through the carrier bag of FIG. **4** with the walls **26**, **27** of the carrier bag, the reinforcing inserts **13**, **13***a* as well as the U-shaped foil strips **14**, **14***a* with welds **17**, **18** slid over the upper edges of each wall and reinforcing insert.

FIG. **2** shows in the upper half the folding of strip **14** separated from foil band **10** and in the lower half a particularly advantageous device for folding and applying of strip **14***a*. This device consists of two horizontally mounted guide rollers offset in height and of a vertical triangle arranged behind in the direction of moving foil **10** indicated by arrow **19**. This triangle has to divert the horizontal strip **14***a* into the vertical position. The triangle is followed by a vertical guide roller and a folding channel open towards the foil band **10**. The cross section of this folding channel varies continuously in such a manner that at the beginning the diverting surfaces are directed transverse to the plane of foil band **10**, while in the adjacent part of the folding channel the direction of the folding surface varies continuously until it extends parallel to the foil band **10**. After applying the U-shaped strips **14**, **14***a* to the foil band **10**, the edges of the strips are provided with continuous weld seams **17**, **18** which connect the U-shaped strips with the foil band.

The reinforcing inserts **13**, **13***a* may be applied to the lower side of a foil band **10**. It is also possible to apply inserts **13** near the edge or directly at the edge on the upper side of a half-hose and to apply inserts **13***a* directly opposite on the lower side of the same half-hose.

FIG. **6** shows a carrier bag from textile material which is provided with an overlapping cover. The wall **28** of the carrier bag with the overlapping cover **29** has a reinforcing insert **13***b* of great width while the opposite wall **30** of the carrier bag has a reinforcing insert **13***c* of smaller width. The reinforcing insert **13***b* is weakened about in the center in longitudinal direction, for example by a perforation **31**. This weakening lies in the height of the upper edge of the front wall **30** of the carrier bag. The upper edge of the overlapping cover **29** is provided with two spaced vertical incisions **32**, **33** which pass also through a part of the reinforcing insert **13***b* so that a hinged cover is obtained, which after closure of the carrier bag, is inserted in the grip aperture **20** of the front wall **30** and in the grip aperture **20***a* of the rear wall **28** whereupon the hinged cover is bent over. Thereby the bag is not only secured but the grip apertures are made more accessible because the hinged cover lies below the lower edges of the reinforcing inserts.

FIG. **8** shows a carrier bag with the reinforcing inserts **13** and **13***a* which are enclosed by a folded foil edge. The grip apertures **20**, **20***a* are punched out below the reinforcing inserts in the same manner as in the carrier bag according to FIG. **6**.

FIG. **9** shows a carrier bag from textile material in which the reinforcing inserts **13***a*, **13***d* of each wall have a great width. Both reinforcing inserts are weakened about in their median longitudinal line. The lateral edges **24**, **25** and **24***a*, **25***a* of the reinforcing inserts **13***c*, **13***d* are arranged a greater distance from the transverse closure welds **21**, **22** than heretofore, so that the edges **24**, **25** may be moved away from the edges **24***a*, **25***a* in such a manner that a thick article of clothing may be inserted between these edges. The grip apertures are punched out in the reinforcing strips and in the reinforcing inserts. There are provided two grip apertures, one below the other, since both upper edges of this carrier bag are bent over together in either direction on the weakening line of the reinforcing inserts.

FIG. **11** shows a perspective view of a carrier bag in which the grip apertures **20**, **20***a* of each wall of the carrier bag are punched out in the several layers of synthetic thermoplastic foil below the reinforcing inserts but within the reinforcement of the edge. By punching out the grip apertures in this manner are obtained tongues **34**, which during punching with a glowing iron, are connected with one another at their edges by welding. By insertion of the hand into the grip apertures for gripping of the carrier bag, these tongues are forced against the lower edge of the reinforcing inserts **13**, **13***a*.

FIG. **13** shows that the reinforcing inserts **13**, **13***a* are bordered by additional welds **35**, **35***a* of the foil layers which form the reinforcement of the gripping edge. The grip apertures are punched out between these additional welds **35**, **35***a* and the welds **17**, **17***a*.

According to FIG. **15**, the carrier bags are produced starting from a hose **10** of synthetic thermoplastic foil. The hose enables the use of a very narrow producing machine, but on a wider machine may be produced simultaneously and side by side two or more carrier bags. The hose **10** may be printed on all sides and is continuously cut open at the longitudinal edge **36** by means of a cutter **37**. In a hose moving in the direction indicated by arrow **19**, or in the half-hose, is effected by means of a cutter **15** passing through both walls of the hose the separation of an upper reinforcing strip **14** and of a lower reinforcing strip **14***a*. As is shown especially in FIG. **19**, both reinforcing strips **14**, **14***a* obtained in such a manner are then displaced in lateral direction and inserted into the half-hose, the lateral displacement corresponding to half of their width. These strips are then continuously or intermittently connected by means of longitudinal welds **17**, **17***a* with the walls **26**, **27** of the half-hose. Effecting of these longitudinal welds **17**, **17***a* may however also be deferred until a later longitudinal welding of the reinforcing strips **14**, **14***a* to the outer hose walls **26**, **27** as described in the following. In the next working step, the reinforcing strips **14**, **14***a* are folded for 180° towards the half-hose as shown in FIG. **20**. If the carrier bags are to be used without reinforcing or carrier inserts as described in the following, the edges **38**, **39** of the strips are now affixed by welding in the longitudinal direction to the outer surfaces of the hose walls which will later form the walls of the carrier bags.

If however in addition to the U-shaped reinforcing strips **14**, **14***a* formed in the above-mentioned manner reinforcing inserts are desired to obtain a greater stiffness of the upper edge of the carrier bag so that by means of punched out grip apertures **20** passing through both hose walls, or the later walls of the carrier bag, the hand may be inserted below these reinforcing inserts, reinforcing inserts **13**, **13***a* are slid between the outer surface of hose walls **26**, **27** and the folds of reinforcing strips **14**, **14***a* as is shown particularly in FIG. **21**. These reinforcing or carrier inserts are obtained by cutting off from webs **40** and **41** which are supplied in the direction indicated by arrow **42**, which is transverse to the direction **19** of movement of the half-hose. The width of these reinforcing or carrier inserts is so dimensioned that they allow the above-mentioned longitudinal welds **38**, **39**. Their length is less than the width of the finished carrier bags so that between the serially arranged reinforcing inserts is provided a gap **23** for effecting the transverse closure welds **21**, **22** with the intermediate separating cut.

When reinforcing inserts **13**, **13***a* are used, the above-mentioned grip apertures **20** are preferably punched out below the same. The grip apertures may however also pass through the reinforcements of the upper edge of the carrier bags formed by the reinforcing strips **14**, **14***a* if they additionally also contain the reinforcing inserts **13**, **13***a*.

FIG. 23 shows a top view of superposed metal sheets 43, 44 overlapping one another. Metal sheet 43 is provided with a diverting edge 45 and metal sheet 44 with a diverting edge 46. These diverting edges are preferably arranged under an angle of 45° to the direction 19 of movement of the half-hose or of the reinforcing strips 14, 14*a* separated therefrom. The two metal sheets 43 and 44 are relatively displaceable in their planes in the directions indicated by double arrow 47. This is effected in such a manner that metal sheet 43 is rigidly connected with a support 48 while metal sheet 44 is provided with slotted holes 49, 50 which allow its displacement.

By the displacement of metal sheet 44 relative to metal sheet 43, the distance between the diverting edges 45, 46 is varied although they are always parallel to one another. This variation of the distance is an index for lateral offsetting of strip 14 in the direction to the interior of the half-hose.

For the purpose of simplified illustration, FIGS. 23 and 24 show a support 48 which is provided only with two metal sheets 43, 44 for lateral displacement of strip 14. The same support 48 may be provided with two further metal sheets formed in the same manner for the further separated reinforcing strip 14*a* which is likewise displaced in the direction to the interior of the half-hose as is shown in FIG. 19.

FIG. 25 shows the production of a carrier bag with reinforcing or carrier inserts which are slid in the same manner as according to FIG. 21 into the space between the outer hose wall 26 and the fold, but with the difference that the fold is not obtained by a strip 14 or 14*a* separated from the half-hose and then fixed again to the same, but by simple folding of the edge. If reinforcing or carrier inserts 13, 13*a* are provided, the U-shaped reinforcement of the edge as illustrated in FIGS. 15 to 22 is not absolutely necessary.

FIG. 25 shows the web 51, for example stiff cardboard, with a feed roll 52. The web 51 rests upon a support 53 provided with a counter edge 54 so that the cutter 55 may cut off the reinforcing or carrier insert 13 from the web 51. The support 53 extends into the range of the fold 56 of the reinforcement of the edge. There is further provided a feeding comb 57. The reinforcing and carrier inserts 13 are advanced between support 53 and comb 57 in such a manner that the advancing force is supplied by the feed roll 52 and that the closely abutting inserts 13 are intermittently advanced the width thereof. The support 53 and the comb 57 are stationary. The hose with its fold 56 moves intermittently in the direction indicated by arrow 19. For the purpose of simplified illustration, the supply of carrier inserts 13 is shown only on the upper side. It is provided in the same manner also on the lower side of the half-hose.

FIG. 26 shows part of a carrier bag produced by means of the device according to FIG. 25.

FIG. 27 shows a carrier bag modified over FIGS. 25 and 26 in such a manner that the same has only one carrier insert 13 and is formed as a carrier bag with an overlapping cover 58. The edge of the overlapping cover is provided with a simple fold 59 in which is punched out the grip aperture 20*b*. If the carrier bag is closed, this grip aperture 20*b* is aligned with the two other grip apertures 20 and 20*a* which are punched out in the two walls 26, 27 below the reinforcing insert 13. Since the overlapping cover 58 engages over the carrier insert 13 when the carrier bag is closed, only one carrier insert is necessary so that the carrier bag may be produced from a smaller number of parts.

We claim:

1. A synthetic thermoplastic carrier bag comprising a doubled over thermoplastic sheet forming both faces and the bottom of the bag; longitudinal weld seams connecting the edges of the two faces; a reinforced upper portion around the open periphery of the top of the bag of at least three sheet layers thick, the leading edge of said periphery formed by a doubled over layer of material separate from said thermoplastic sheet, the edges of said thermoplastic sheet at the open periphery being contained within the doubled over separate layer of material, and the edges of said doubled over separate layer of material being welded to said thermoplastic sheet; and a grip aperture in each face.

2. A carrier bag as claimed in claim 1 further comprising at least one reinforcing insert covered by said doubled over layer of material, said insert being of a length slightly less than the width of said two faces so as not to interfere with said longitudinal weld seams.

3. A carrier bag as claimed in claim 1 further comprising two reinforcing inserts, one above the other, in each face covered by said doubled over layer of material, there being a grip aperture punched out in each insert, and the length of each of said inserts is appreciably less than the width of said two faces to allow the areas of the two faces adjacent said reinforcing inserts to be moved apart from each other.

4. A carrier bag as claimed in claim 3 wherein said two reinforcing inserts in each face is one piece having a weakened line along the median longitudinal axis thereof, and the top insert in each face is capable of being doubled over the bottom insert so that the two grip apertures in each face are overlapping.

5. A carrier bag as claimed in claim 2 wherein one face of the carrier bag has a greater height than the other face and the carrier bag face of greater height is provided with a reinforcing insert, the width of which is approximately twice the width of the reinforcing insert in the face of smaller height, the greater width reinforcing insert has a weakening along the median longitudinal axis so that the portion extending above the median longitudinal axis may be bent over the leasing edge of the face of smaller height.

6. A carrier bag as claimed in claim 5 wherein the leading edge of the carrier bag face of greater height is provided in the center with two spaced vertical incisions beginning at the leading edge and passing through part of the reinforcing insert to form a tab so that it can engage with the grip aperture in the other face.

7. A carrier bag as claimed in claim 2 wherein the grip aperture in each face is formed below the reinforced upper portion and reinforcing inserts of each face.

8. A carrier bag as claimed in claim 2 wherein the reinforcing inserts are loosely arranged in the pockets formed by the doubled over layer of material.

9. A carrier bag as claimed in claim 2 wherein the grip apertures are formed within the area in the reinforced upper portion between the reinforcing inserts and the welded edges of the doubled over separate layer of material.

10. A carrier bag as claimed in claim 9 further comprising an additional weld immediately below the reinforcing inserts, said additional weld extending the entire width of each face.

11. A carrier bag as claimed in claim 2 wherein one face has a reinforced upper portion of greater height than the other face, said one face has a reinforcing insert covered by said doubled over layer of material, and while the leading edge of said other face is higher than the leading edge of said one face the reinforced upper portion has no reinforcing insert, the grip aperture in said one face is below the reinforcing upper portion and the grip aperture in said other face is within the reinforcing upper portion.