May 22, 1956 A. C. GRAELL 2,746,502

BAG WITH INTEGRAL CLOSING MEANS

Filed Feb. 15, 1954 2 Sheets-Sheet 1

Fig. 1

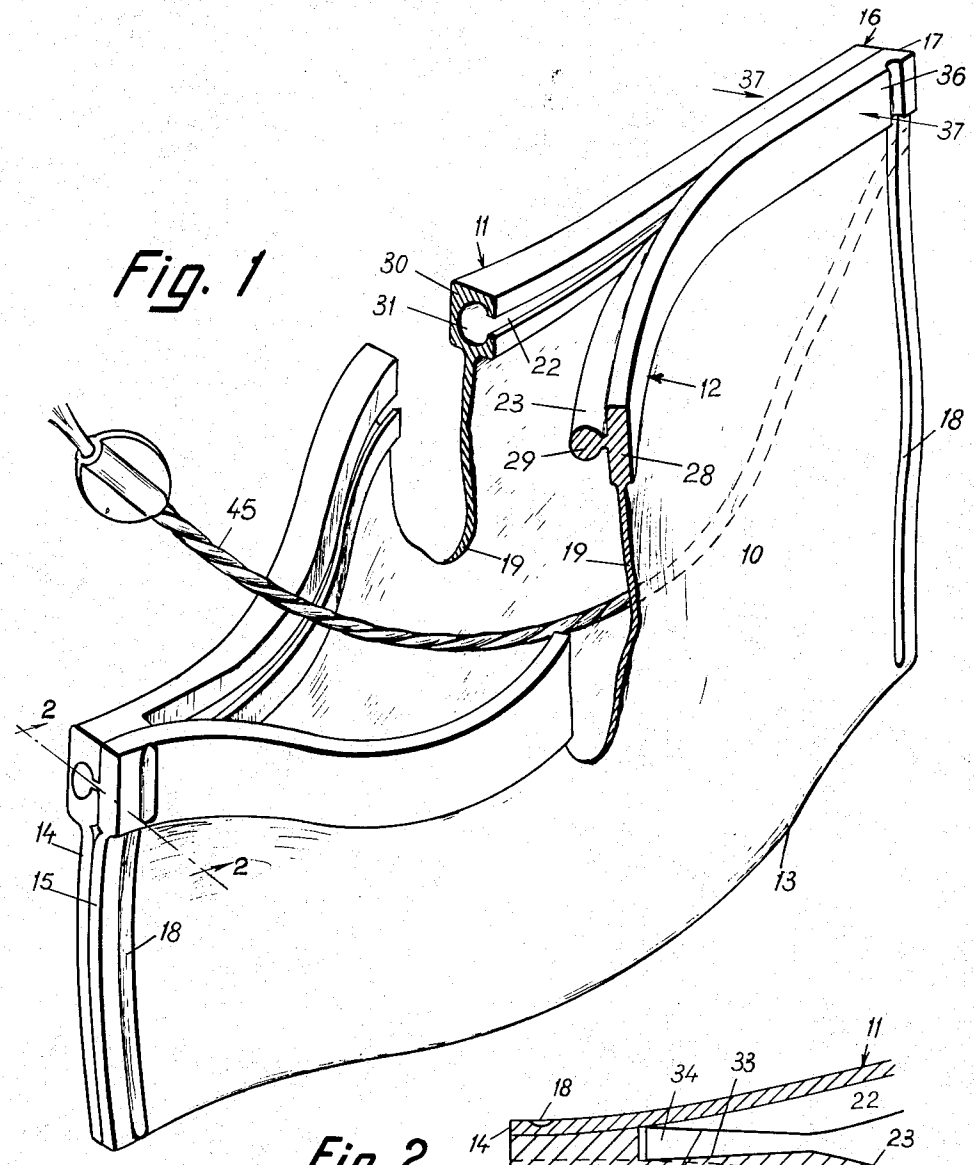
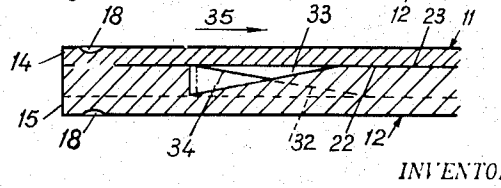


Fig. 2

Fig. 3



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Fig. 4

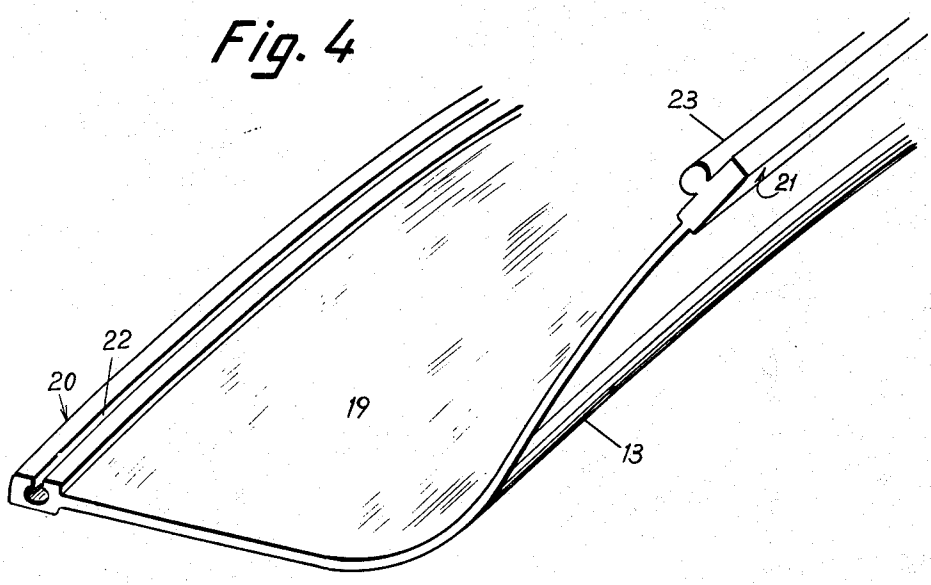


Fig. 5

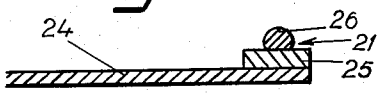


Fig. 6

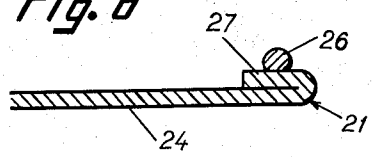
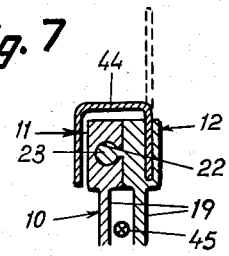


Fig. 7



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BAG WITH INTEGRAL CLOSING MEANS

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Application February 15, 1954, Serial No. 410,255

3 Claims. (Cl. 150—3)

The present invention relates to a bag provided with integral closing means.

The object of the invention is to provide a bag with integral closing means allowing a closure impervious to dust and liquids, adapted to be obtained at a very low cost, so that the bag may be utilized for provisionally holding or protecting objects which are supplied at stores, for example foods, against foreign matters and hereafter discarded.

The invention is characterized in that it comprises at least a lamellar element made of flexible material, the edges of said element being joined to one another so that they form a bag having two faced walls, said walls being provided with respective edges adapted to be joined with one another to close the bag, said walls further having on their facing surfaces and close to the edges thereof respective means arranged lengthwise of said edges, elastically engageable with one another to constitute a closure impervious to dust and moisture.

Other and further objects of the invention will be apparent from the following detailed discussion of some preferred embodiments of the invention taken together with the accompanying drawings in which

Figure 1 is a perspective view, partially cut away, of the portion adjacent to the opening of a bag provided with closing means according to the invention;

Figure 2 is a cross-section taken on the line 2—2 of Figure 1, showing the formation of the opening for starting the separation of the closing edges;

Figure 3 is a view similar to that of the Figure 2, the closing means being coupled;

Figure 4 is a perspective view of a portion of a continuous sheet applicable for the manufacture of the bag in the particular disclosure;

Figures 5 and 6 are respective cross-sections through the male edge of the continuous sheet in two alternative embodiments thereof;

Figure 7 is a section of the closure of the bag with a form of holding means to hold the bag closed.

Although the drawings show the diverse parts of the bag as being provided with exaggerated thicknesses for the purpose of making the showing more easy, it must be understood that the scope of the invention is not restricted by such dimensional features and in practice the invention may be developed with the thicknesses of the materials commonly found in the market.

The bag **10** is formed of a sheet of lamellar material of an enough flexible nature such as to allow the bending to which the bag will be subjected in use. For example, the invention contemplates the utilization of materials of the kind of polythene and the like, which are preferred due to their relatively easily being joined to form impervious closures, either by cementing or by welding with application of heat or circulation of high frequency currents. Stitching may be also a method well suited and economical for this purpose, preferably when the sheet **10** is formed of fibrous materials such as waterproofed paper and textiles.

The sheet **10** is cut to such measurements and outlines that it shows two parallel edges **11**, **12** and is bent following an intermediate line shown at **13** in the Figures 1 and 4, at the same distance from each said edge and parallel to the same.

The two adjacent edges **14**, **15** and **16**, **17** which result between the edges **11**, **12** and the line **13** at each side of the bag, within the new two-ply outline obtained, are joined to one another, within the said pairs, by means of a welded seam **18** extending from the line **13** to the adjacent free edges **11**, **12**.

When utilizing other methods for bonding the edges **14**, **15** and **16**, **17**, the specific kind of union thus resulting may be substituted for the welded seam without this meaning a departure from the scope of the invention.

Preferably the sheet **10** is obtained by transversely cutting an endless strip **19**, Figure 4, made of the already described material, which longitudinal edges **20**, **21**, are provided with means **22**, **23** engageable with one another to form a closure impervious to dust and moisture, which are described hereafter. These longitudinal edges are those selected in the sheets **10** cut from said endless strip to constitute the adjacent free edges **11**, **12** of the bag.

The endless strip **19** is obtained according to any conventional laminating process, provision being made in the laminating rollers or extruding dies of spaces suitable for providing the reinforced edges **20**, **21**, either direct in their final shape or the edges **20**, **21** obtained in an intermediate state may be subjected to further drawing extrusion or lamination stages with the purpose of obtaining the respective final cross-sections, eventually with simultaneous application of heat according to one of the well known methods. The reinforced edges **20**, **21** may also be provided by bonding to the plain edges of a conventional endless strip **24**, Figure 5, complementary laminations **25**, **26** which are integrated to the general section of the sheet, either through one or more laminating extruding, welding or cementing steps, or through combinations of such operations.

In the Figure 5, the edge **21** is intended to constitute the male element of the engageable means and it is obtained by superimposing the narrow laminated element **25** on the edge of the sheet **24**. The laminated element **25** is bonded to the sheet by any of the previously indicated methods and has for its object to provide an increased cross-section over which the circular section profile **26** forming the coupling means is fastened in a similar manner.

In the Figure 6, the male element is obtained by bending a marginal portion **27** of the sheet **24**, securing the portion **27** to the sheet body and coupling onto the increased section thus obtained the complementary profile **26**. The bonding of these elements in order to constitute a single profile may also be carried into practice by any of the methods set forth, which will be well known to any expert in the manufacture of plastics.

In the cases wherein the material forming the bag is of a fibrous nature such as paper or textiles, the reinforced edges **20**, **21** may be provided by coupling profiles like those already described to the edges of the corresponding sheets, eventually after forming the edges of the fibrous material with means intended to facilitate the bonding thereof to the plastic, for example holes or other surface deformities.

In either case the edge **20** constitutes a female coupling means engageable with the male element **21**.

The cross-section of the element **21** comprises a reinforced section **28**, Figures 1, 4, 7, of substantially rectangular shape, coupled by one smaller side thereof to the laminar body **19** which constitutes the bag. The greater side of the reinforced section **28** which faces to

the edge 20 when the ensemble is in operative position is formed with a circular salient portion 29 having a diameter greater than the width of its zone of union with the part 28.

The cross section of the female element 20 comprises a rectangular section 30 of similar arrangement to that of the element 21. The greater side of this rectangular section which faces the male element previously described, when the ensemble is in operative position, is formed with a recessed section 31 substantially corresponding with the section 29 of the male element.

In this manner, the female element 20 is formed with a longitudinal groove 22 facing to the male element. The width at the opening of this groove is less than the width of the groove at intermediate depths of the same. The male element 21 has a longitudinal rib 23 located in engaging arrangement with said groove and having a diameter greater than the section wherein the rib joins with the male element 21.

As the material forming the elements described is flexible, it is obvious that the same may be coupled with one another by urging the rib 23 into the groove 22. Then the elements remain coupled with one another until a great enough contrary action forces the separation thereof for opening the bag.

It may be seen that any cross-section of the elements 22, 23 bearing the feature of having, the rib 23 a restricted width at the section joining the reinforced edge 21 and, the groove 22 a mouth narrower than their intermediate portions is well suited for utilization with the present invention although they may have a geometrical shape substantially differing from that described.

In the same manner, there may be provided in the device according to the invention, more than one pair of engageable elements without departing from the scope thereof.

A wedged cut 32, 33 is provided adjacent to each one end of said reinforced edges, which cut extends from the inner face or greater side of the cross-section of the edge towards the outer face or opposite greater side of the same. In the reinforced edge 20, this cut 32 intersects completely the section of the groove 22, starting at an intermediate point near to one end of the edge and towards such end. In the reinforced edge 21, the cut 33 extends until completely intersecting the rib 23, starting and terminating at the same point according to the length of the edge as the cut in the edge 20.

The material comprised between these cuts has been removed so that between the two edges 20, 21 a cavity 34 is formed, shown in the Figures 2 and 3, which communicates the outside with the inside of the bag through the junction of the closure.

In the Figure 2 the cavity is disclosed in the opened position of the closing means.

In the Figure 3 the cavity is shown in the closed position of the closed means.

These cuts are made long enough so that the cavity 34 is present either with the closing means in their engaged position as shown in Figure 3, so that one can insert a nail or a suitable tool into the cavity and to open the closure by moving the tool or nail lengthwise of the edges 20, 21 as indicated by the arrow 35. In this manner the closure may be opened in a similar manner as a conventional slide fastener is operated.

As illustrated in the figures and described in the foregoing specification, the bag may be closed by hand by holding the bag with two fingers of one hand at the point 36 and grasping with two fingers of the other hand the edges 20, 21 with a given pressure applied as the arrows 37 at a point adjacent and placed inwardly of the edges, for example at the position shown by the arrows 37, then the fingers of the second hand are moved towards the other end of the edges while holding the pressure according to the arrows 37 until reaching the whole engagement of the elements 22, 23, when the bag results sealed.

Opening the bag is performed from the end provided with the cavity 34, as already explained.

In the cases wherein no special means for closing the bag is provided, I prefer to use a simple securing means consisting in a flexible strip 44, Figure 7, cemented or otherwise secured to one edge 20, 21. The strip 44 is placed initially in straight position extending upwardly from the edge of the bag as shown in dotted lines. Once the bag is closed the strip 44 is bent over the edges 20, 21 and again at the opposite side of said edges as better shown by full lines in the Figure 7.

It may be also advisable to secure a string 45, Figures 1 and 7, at the one end of the closure, for example by bonding one end of the string with the welded portions which constitute the welded seam 18. This string extends loosely within the bag and is made to protrude to the outside through the cavity 34. When the bag is in closed position, it may be opened by pulling out the string 45 which, on moving between the bevelled cuts 32, 33 will force the edges 20, 21 to separate from one another until completely opening the bag. In the case where the securing means of Fig. 7 is present, the flexible strip 44 will be unbent by the action of the edge 20, which will be forced out of engagement with the rib 23 by the action of string 45 at the junction between edges 20 and 21.

It is obvious, of course, that various modifications such as shape and size, as well as suitable materials can be utilized in the present invention without departing from the scope thereof as defined in the appended claims.

I claim:

1. A bag with integral closing means, comprising at least a lamellar element of a flexible material, the edges of said element being joined to one another so that they form a bag having two walls facing each other, said walls having means on the edges of their facing surfaces arranged lengthwise of said edges, part of said means being elastically engageable to constitute a closure impervious to dust and moisture, said means having opposed cut away portions at one end of said edges, said portions being cut away to leave an opening in said closure at said one end of said edges, and string means attached within said bag adjacent the end of said edges opposite the end having the opening in said closure means, said string means extending out of said opening to permit opening of said closure means.

2. A bag with integral closing means, comprising at least a lamellar element of a flexible material, the edges of said element being joined to one another so that they form a bag having two walls facing each other, said walls having means on the edges of their facing surfaces arranged lengthwise of said edges, part of said means being elastically engageable to constitute a closure impervious to dust and moisture, said elastically engageable means comprising a reinforcement along an edge of one wall having at least one groove arranged lengthwise thereof close to said edge and facing the other wall, the distance between the edges of said groove being less than the distance between the walls of the groove at an intermediate depth thereof, and the portions of material adjacent the edges of said groove tending to maintain said distances, a reinforcement on the edge of the other wall having fixed thereto at least one member facing said groove, which member has a cross section corresponding to the cross section of the groove so that it may be urged into said groove thus providing a tight closure along said edges, said groove containing reinforcement and said member with a cross section corresponding to said groove having opposed cut away portions at one end of said edges, said portions being cut away at an angle to the axis of said groove containing reinforcement and said member with a cross section corresponding to said groove to leave an opening in said

closure at said one end of said edges, and string means attached within said bag adjacent the end of said edges opposite the end having the opening in said closure means, said string means extending out of said opening to permit opening of said closure means.

3. A bag with integral closing means, comprising at least a lamellar element of a flexible material, the edges of said element being joined to one another so that they form a bag having two walls facing each other, said walls having means on the edges of their facing surfaces arranged lengthwise of said edges, part of said means being elastically engageable to constitute a closure impervious to dust and moisture, said elastically engageable means comprising a reinforcement along an edge of one wall having at least one groove arranged lengthwise thereof close to said edge and facing the other wall, the distance between the edges of said groove being less than the distance between the walls of the groove at an intermediate depth thereof, and the portions of material adjacent the edges of said groove tending to maintain said distances, a reinforcement on the edge of the other wall having fixed thereto at least one member facing said groove, which member has a cross section corresponding to the cross section of the groove so that it may be urged into said groove thus providing a tight closure along said edges, said groove containing reinforcement and said member with a cross section corresponding to said groove having opposed cut away portions at one end of said edges, said portions being cut away at an angle to the axis of said groove containing reinforcement and said member with a cross section corresponding to said groove to leave an opening in said closure at said one end of said edges, said closure means further comprising a flexible member fixed along the top edge of one of the walls and adapted to be bent over the edges of the walls over the opening between them, and string means attached within said bag adjacent the end of said edges opposite the end having the opening in said closure means, said string means extending out of said opening to permit opening of said closure means.

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