

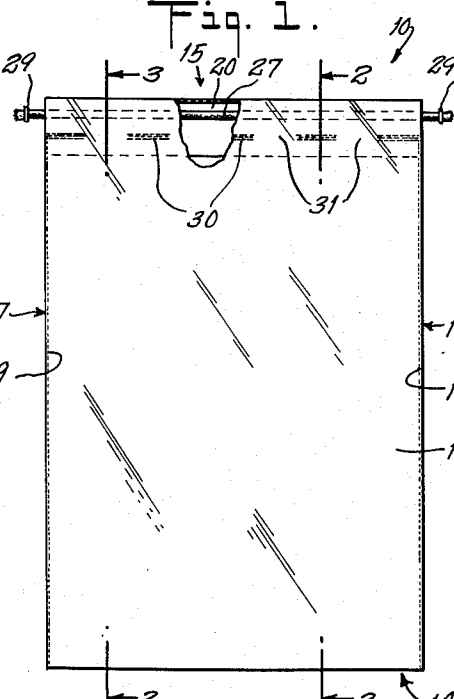
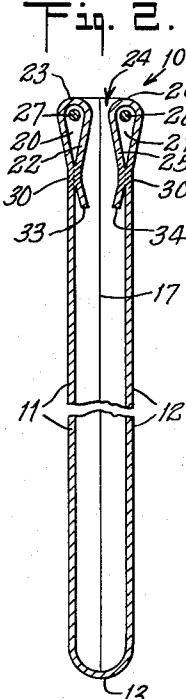
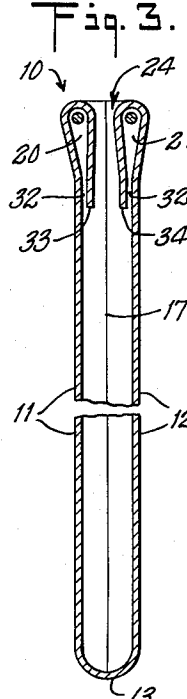
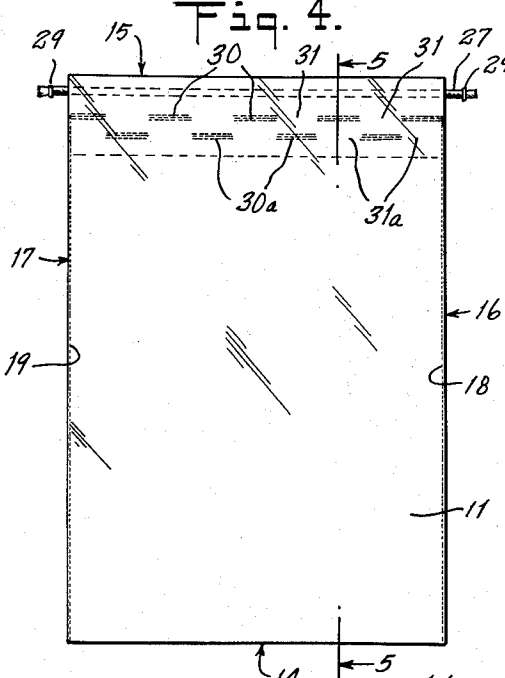
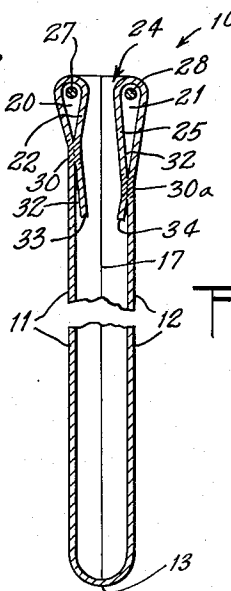
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E. KUGLER

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DRAWSTRING BAG

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INVENTOR.

EMANUEL KUGLER

BY

Ward, Neal, Haselton, Orme + McElhannon
ATTORNEYS

1

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DRAWSTRING BAG**Emanuel Kugler, 296 Hungry Harbor Road,
Valley Stream, N.Y.****Filed May 18, 1962, Ser. No. 195,741****4 Claims. (Cl. 229-63)**

This invention relates to the construction of bags made of flexible plastic, such as polyethylene, of the type which has a drawstring within a tubular hem at its mouth end. More particularly, the invention relates to a more effective technique for forming the tubular hem which contains the drawstring in such bags.

In the manufacture of polyethylene bags it is conventional to employ heat as a sealing means. Thus, a typical form of drawstring bag, which will be described for the purpose of illustrating the invention, has opposed front and back face panels which are joined together along lines of heat seal which form the side edges of the bag. The panels are also joined together at the bottom end of the bag or, alternatively, the panels may be formed from a single sheet of polyethylene material which is folded to provide a closed bottom end of the bag. In any event, the top end of the bag is open so as to provide a mouth through which the articles to be contained will enter the bag. Surrounding the mouth is a tubular hem within which a drawstring is disposed for closing the bag mouth, in well known manner, after the bag has been filled.

The tubular hem is typically formed by lip portions of the respective front and back face panels, the lip portions being respectively folded, either within or outside of the bag, so as to lie adjacent the face panel of which it is a part. Upon sealing the free edge of the lip portion to its adjacent face panel, a tubular hem is formed for receiving a drawstring, the hem extending the width of the bag between its aforementioned side edges.

Heretofore, the folded lip portions have each been sealed to their respective adjacent face panels by a line of heat seal extending the length of the lip portion. Insofar as is known, this line of heat seal has always been a continuous line, the seal being made by a heated sealing bar or the like, in conventional manner.

It has been found that in the normal procedure of manufacture, either deviations in the pressure of the sealing bar, or the application of too much heat in forming the seal, or both, commonly occur. As a result of even slight inaccuracies in these respects, and additionally because of the softness and thinness of the polyethylene material, upon forming these continuous lines of heat seal it is more often found that a line of weakness has been created, rather than a line of strength, which tends to rupture or tear when weighty articles are dropped into the bag while the bag is being held open and supported either by the drawstring or by gripping of the tubular hem portions at the mouth end of the bag. Similarly, when the bag is filled with weighty articles and held by the drawstring which closes the bag mouth, as is common practice, it has been found that such continuous lines of heat seal at the tubular hems tend to rupture, so that the hems become detached whereupon, usually unexpectedly, the body of the bag falls away from the drawstring or the detached hem portions by which it was supported.

It is difficult to inspect the bags in their initially manufactured condition and locate the very small incipient de-

2

fects in the heat seal at the tubular hem as could initiate such bag rupture, and it is apparent that much inconvenience to both the manufacturer and the customer is caused by their presence. Moreover, disruption of bag filling procedures, involving lost time or product spoilage, results upon rupture of the drawstring hem in so much as one such bag as it travels along the filling line.

To correct these difficulties by rigidly controlling the heat sealing mechanism, or the manner of feeding the folded lip portions with respect thereto during the bag manufacturing process, is very costly, since such controls are not easily effected.

Accordingly, it is an object of the invention to eliminate the aforementioned weakness in drawstring bags by altering the bag construction in the area of its drawstring hem.

It has been found that the referred to defect in drawstring bags of the heat sealed, polyethylene type may be eliminated, or rendered inconsequential, by forming the heat seal at the drawstring hem with interruptions along its length, rather than in the continuous, full line manner as is presently conventional. Thus, the seal is effected at spaced intervals along the tubular hem, the intervening spaces being unsealed. It appears that the effectively "dashed" heat seal line is much stronger than the prior, continuous type of heat seal line with respect to its ability to resist detachment of the tubular hem under circumstances as previously explained, even though the cumulative total of heat sealed areas may be considerably less than that as is provided by a line of heat seal which extends continuously across the full width of the bag.

In a modified form of the invention, a second "dashed" line of heat seal is provided in parallel, spaced relation with respect to the first such line, the heat sealed areas of the second such line being offset in the direction of their lengths with respect to those areas provided by the first such line so that the cumulative total length of heat sealed areas at the tubular hem may be about the same as would otherwise be provided by a continuous line of heat seal, yet the aforementioned objects of the invention will be attained.

These and other objects, features and advantages of the invention will become more fully apparent from the following detailed description thereof, when taken with reference to the accompanying drawings which illustrate, by way of example, certain embodiments of the invention.

In the drawings:

FIGURE 1 is a front elevation of a bag made in accordance with the invention, certain portions being cut away to more clearly illustrate its features;

FIGURE 2 is an enlarged sectional view of the bag shown in FIGURE 1, the section being taken at line 2-2 thereof;

FIGURE 3 is a similarly enlarged sectional view of the bag shown in FIGURE 1, the section being taken, however, at line 3-3 of FIGURE 1;

FIGURE 4 is a front elevation of a bag embodying a modified form of the invention; and

FIGURE 5 is an enlarged sectional view of the bag shown in FIGURE 4, the section being taken at line 5-5 thereof.

Referring first to FIGURES 1, 2 and 3, a draw-string bag made in accordance with the invention is generally indicated by reference numeral 10. The bag is made of

thin and highly flexible, transparent, thermoplastic material, such as polyethylene, and has a front face panel 11 which merges with an oppositely disposed and generally coextensive back face panel 12 along a line of fold 13 at the bottom end of the bag. The bottom end of the bag is generally indicated by reference numeral 14. As also generally indicated by the respective reference numerals, the bag 10 may be considered as having a top end 15, and side edges 16 and 17. It should be understood, however, that the particular manner in which the side edges 16 and 17 are formed, or the particular manner in which the closed bottom end 14 of the bag is formed, does not form a material part of the invention. For example, the bag might be made in a seamless tubular form having its bottom end 14 closed by a line of heat seal or other mode of attachment. Moreover, either the side edges 16 and 17 or the bottom end 14, or both, may have gusseted or other construction without affecting the invention in its broad aspects.

However, in the illustrated embodiment, at each of the opposite side edges 16 and 17, the front and back face panels are attached together, as by lines of heat seal 18, 19 respectively.

Referring now to the top end 15 of the bag 10, it will be understood that tubular hems 20 and 21 are formed, respectively, along the top of the front face panel 11 and the back face panel 12. The tubular hem 20 is formed by folding an extended lip portion 22 of the front face panel 11 along a line of fold 23, so that the extended lip portion 22 lies adjacent to the front face panel 11 of which it is an extension, and within the mouth of the bag, the latter being generally indicated by reference numeral 24. Similarly, the tubular hem 21 is formed by the similar folding of the extended lip portion 25, of back face panel 12, along line of fold 26. The extended lip portions 22 and 25 might be folded outwardly of the mouth portion 24 rather than inwardly, and lie adjacent the respective exterior surfaces of the face panels 11 and 12.

As will be understood from FIGURE 1, each of the tubular hems 20 and 21 extends across the full width of the bag between its side edges 16 and 17. Moreover, the respective ends of each of the tubular hems 20 and 21 are open, the longitudinally extending lines of heat seal 18 and 19, at the side edges of the bag, terminating at a location which is longitudinally spaced from the top end 15 of the bag.

In the embodiment shown, complementary drawstrings 27, 28 are disposed within each of the respective tubular hems 20, 21, the drawstrings 27 and 28 each having length which is greater than the width of the bag between side edges 16 and 17 so that the drawstrings project outwardly of the side edges 16 and 17 to be attached together at these locations by the staples 29. Thus, the complementary drawstrings 27 and 28 are attached together to effectively provide a drawstring loop extending through the tubular hems 20 and 21.

So as to form each of the tubular hems 20 and 21 within which the respective drawstrings 27 and 28 are contained, each of the extended lip portions 22, 25 are attached respectively to front and back face panels 11 and 12 by relatively short lines of heat seal 30. The short lines of heat seal 30 are disposed in alignment, and extend across the full width of the bag between its side edges 16 and 17. Intervening spaces 31 between the respective lines of heat seal 30 provide unattached areas or zones 32 (FIGURE 3) between the extended lip portions 22, 25 and the respective front and back face panels 11 and 12. Thus, all of the relatively short lines of heat seal 30, together with their intervening spaces 31, as they extend across the width of the bag may be alternatively referred to as a "dashed" line of heat seal which attaches either of the extended lip portions 22, 25 to the face panel to which it lies adjacent. The lines of heat seal 30 are longitudinally spaced from the top end 15 of the bag and pro-

vide such attachment adjacent the respective free edges 33, 34 of the extended lip portions 22, 25.

In a bag filling operation, the mouth 24 is opened by drawing apart the front and back face panels 11, 12, at the top end 15 of the bag, whereupon articles of merchandise, such as potatoes, or other produce, may be simply dropped into the bag. When filled, the bag is simply grasped and lifted by its drawstring, whereupon the weight of the contained merchandise will effect a closing of the mouth 24 by causing the front and back face panels 11 and 12 to pucker along the length of their respective tubular hems 20 and 21, as is well known and understood. The bag may be subsequently supported or carried by its drawstring without risk of detachment of either of the extended lip portions 22 or 25 from the respective face panels as would tend to permit severance of the drawstring from the bag.

Referring now to FIGURES 4 and 5, a modified form of drawstring bag is illustrated. Excepting for the manner of attachment of the extended lip portions to the face panels to form the respective tubular hems, the bag of FIGURES 4 and 5 is in all respects identical to that shown in FIGURES 1 and 3. Accordingly, the like elements are identically numbered.

However, in its embodiment as shown in FIGURES 4 and 5, each of the extended lip portions 22 and 25 are attached, respectively, to front face panel 11 and back face panel 12, not only by relatively short lines of heat seal 30 which provide the intervening spaces 31, but also by the additional relatively short lines of heat seal 30a which provide intervening spaces 31a. The lines of heat seal 30a are in alignment, and are in parallel spaced relation, in longitudinal direction with respect to the bag 10, with respect to the relatively short lines of heat seal 30. Thus, the attachment is made by two "dashed" lines of heat seal, the total of the lengths of all of the lines of heat seal 30 and 30a which attach either of the extended lip portions to its respective face panel being approximately equal to the width of the bag between its side edges 16 and 17. Moreover, it will be noted that, as regards the alignment of the dashed line portions in longitudinal direction with respect to the bag 10, the lines of heat seal 30a which form the lower of the dashed lines are disposed adjacent to the intervening spaces 31 within the other of the dashed lines of the heat seal. Referring to FIGURE 5, it will be understood that, at substantially any cross section of the bag, there will be a location of heat sealed attachment between either of the extended lip portions and its respective face panel.

Moreover, to facilitate the manufacturing process, it is considered preferable that all of the heat sealed portions be of equal length, and that in any line thereof they be spaced apart by equal distances, these being substantially equal to their lengths, as indicated in the drawings.

Thus has been described a drawstring bag, in several of its embodiments, which achieves all of the aforesaid objects of the invention.

What is claimed is:

1. A drawstring bag of heat sealable material having a top end providing an openable mouth of the bag, a closed bottom end, and opposed side edges, and including oppositely disposed front and back face panels, each of said front and back face panels having an extended lip portion at said top end of the bag, each said lip portion being folded so as to lie adjacent to the face panel of which it is an extension and being directly attached to its said adjacent face panel by a plurality of separate heat seals providing unattached portions extending in the direction of, and substantially across the width of said bag between its said side edges, whereby each said attached lip portion provides a tubular drawstring hem, and drawstring means disposed within said tubular hems and surrounding said openable mouth.

2. A drawstring bag according to claim 1 wherein said

5

plurality of heat seals are disposed within at least two spaced apart rows thereof, the locations of said heat seals within one such row being disposed substantially adjacent said unattached portions between said heat seals in the other of such rows.

3. A drawstring bag according to claim 2 wherein the length of each said heat seal within said one row is substantially equal to the length of the said unattached portion of the other of said rows to which it is adjacent.

4. A drawstring bag according to claim 3 wherein the lengths of all said heat seals in said rows are substantially equal to each other.

6

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