This invention relates to the art of making draw string bags from heat sealable material and more particularly to improved method and apparatus for making draw string bags in which one or more draw strings along one or both lips of the bag are utilized to reduce the effective size of the opening at the mouth of the bag through which articles may be inserted or withdrawn.

Previously, the manufacture of such draw string bags in quantity has been seriously handicapped by the fact that the bags have had to be produced in large part by hand operations. This situation is in sharp contrast to the production of bags other than the draw string type in which the production is largely automatic. Sales of draw string bags have therefore been only a fraction of potential sales since draw string bags have previously not been able to compete economically with other types of bags due to the many hand operations required in the manufacture of the draw string bags. It is an object of the present invention to provide method and apparatus for producing such draw string bags automatically thereby substantially eliminating the above mentioned problem.

According to one aspect of the present invention, draw string bags may be made by advancing a web or sheet of flexible, heat sealable material and positioning string means along the advancing web adjacent the longitudinal edges thereof while folding the respective edges of the advancing web over the string means. The folded over edges are then sealed to adjacent portions of the web to form tubular hems containing the string means along the longitudinal margins of the web. The web may then be folded longitudinally to bring the hems forming the opposite margins thereof into opposed relation. The material of the web, including material of the hems surrounding the string means, is then severed transversely at bag width intervals to form separate bag segments connected by said string means and the string means is thereafter severed intermediate the bag segments to form separate bags.

Any suitable flexible, heat sealable material may be used in making bags according to the present invention but plastic materials having elastic properties such as polyethylene are preferred. The thickness of such material may vary over a wide range but the usual thickness of polyethylene for average use is between about 0.001 and about 0.010 inch. Where relatively thin material is used or where heavy loads are to be carried it may be desirable to use multiple thicknesses of material.

Any suitable string means may be used in constructing bags in accordance with this invention and it is intended for instance that conventional cords or plastic strings as well as metal strips or tapes may be used for this purpose.

In practicing this invention it is preferred that the web or sheet of material have elastic properties and be under tension so that it is stretched in a longitudinal direction while the string means is being positioned as described above. The string means is preferably positioned along the web in a substantially relaxed or unstretched condition. As described in greater detail below, this results in longitudinal contraction of the web material when the web is severed transversely and this contraction allows a length of string means to be exposed between successive bag segments following the severing operation. If desired, the string means may be fed slightly faster than the web is advanced to provide still more string means for exposure between bag segments as described below.

The string means passing through each bag may be fastened in any suitable manner. For instance, heat sealing techniques may be employed with heat fusible string while suitable means such as staples may be used to fasten other types of string means such as ordinary cords. The string means may be fastened at any suitable locations depending upon the type of bag preferred. The string means may, for instance, be fastened to the bag material near either or both longitudinal margins of each finished bag or, where draw strings are employed in both front and back lips of the finished bag as described in the preferred embodiment described below, the respective strings of each bag may be fastened together outside the bag at either or both sides of the bag.

After the material of the web is severed into separate bag segments it is preferred to fasten the string means prior to severing the strings between the bags. If, as described below, it is desired to fasten strings of each bag together at points outside the bag on both sides thereof, the strings between each pair of bag segments are preferably fastened together at closely spaced points intermediate such segments and the strings between such points may then be severed to form the finished bags.

According to another aspect of the invention, apparatus is provided for making draw string bags which comprises means for advancing a web of flexible, heat sealable material having elastic properties under tension whereby said web is stretched longitudinally, means for positioning substantially unstretched string means adjacent the edges of the advancing web and unfolding said edges over said string means as the web advances, means for sealing the folded edges of the web to opposed portions of the web to form tubular hems containing string means along the longitudinal margins of the web, means for folding the web longitudinally to bring the tubular hems into opposed relation, and means for severing the material of the web including material surrounding the string means at bag width intervals to form bag segments having continuous string means therebetween.

Various further and more specific objects, features and advantages of this invention will appear from the description taken in connection with the accompanying drawings which form a part of this specification and illustrate by way of example one embodiment of the invention. The invention consists in such novel features and combinations of parts as may be shown and described in connection with the method and apparatus herein disclosed.

In the drawings:

FIG. 1 is a plan view of a web of bag material showing somewhat schematically certain steps in the formation of a bag in accordance with the invention;

FIG. 2 shows the same web in a later stage of formation;

FIG. 3 is a cross-sectional view taken along 3--3 of FIG. 2;

FIG. 4 shows a still later stage in the formation of the web shown in FIG. 1 into bags such as that shown in FIG. 6;

FIG. 5 shows a still later stage in the formation of the web shown in FIG. 1 into bags such as that shown in FIG. 6;

FIG. 6 is a plan view of a bag which may be constructed according to the method of this invention;

FIG. 7 is a top end view of the bag shown in FIG. 6;

FIG. 8 is a cross-sectional view taken at 8--8 of FIG. 6 on a somewhat enlarged scale;

FIG. 9 is a somewhat diagrammatic perspective view of apparatus constructed in accordance with the invention.
and suitable for making bags in accordance with the invention;

FIG. 10 is an enlarged perspective view in somewhat greater detail of a portion of the apparatus shown in FIG. 9;

FIG. 11 is another view of a portion of the apparatus shown in FIG. 10;

FIG. 12 is still another view of the apparatus shown in FIG. 10;

FIG. 13 is a somewhat enlarged perspective view of another portion of the apparatus shown in FIG. 9 showing certain features of the apparatus in somewhat greater detail;

FIG. 14 is a plan view of a portion of the apparatus shown in FIG. 9;

FIG. 15 is a somewhat schematic side elevation of a portion of the apparatus shown in FIG. 9 and showing the apparatus in greater detail;

FIG. 16 is a somewhat diagrammatic plan view of a portion of the apparatus shown in FIG. 9;

FIG. 17 is a cross-sectional view of a portion of the apparatus shown in FIG. 9 taken at line 17-17 of FIG. 16 and showing the apparatus in greater detail;

FIG. 18 is a cross-sectional view of a portion of the apparatus shown in FIG. 9 taken at line 18-18 of FIG. 16 and showing the apparatus in greater detail;

FIG. 19 is a cross-sectional view of a portion of the apparatus taken along line 19-19 of FIG. 18; and

FIG. 20 is an enlarged perspective view of a portion of the apparatus shown in FIG. 19.

In making draw string bags according to a preferred embodiment of the present invention, I take a roll of polyethylene sheeting or other suitable material and stretch the same in a machine. While it is in this taut, stretched condition I form and seal two hems, one on each side of the material. Contained and stretched within the hems I have inserted my string or ribbons in a relaxed condition, fed from two rolls or spools (four rolls if double draw strings are used).

I now fold this hemmed sheet of material. This lays the hemmed portion adjacent to or on top of each other. This folded sheet is still held in a taut stretched condition.

I then sever and seal the folded sheet (which is still in the stretched condition) in one operation. I leave the cords or ribbons unsevered (i.e., intact). It is at this point that the severed portion of the sheet is allowed to relax and contract.

This gives me a bag or a bag segment with hemmed cord or ribbons on one side, flat, folded or gusseted on the opposite side, and the two remaining edges sealed.

As a result of the separation and resulting relaxing or "snapback" of this portion of the sheet, with its contained relaxed unsevered cords, a space is created between the forward released bag and the edge of the controlled web.

In the space created between the bags the strings or cords are still one continuous piece. I take advantage of this space during the process and fasten or weld the strings together. The strings are then severed between fasteners creating a completed draw string bag.

If more space is required between each bag or bag segment, I can corrugate the string or move or accelerate the bag or bag segment position forward with respect to the following bag or bag segment.

I can also do other miscellaneous operations with regard to holes or holes, slits, notches or perforations that may be cut into the hem or hems at any position before sealing of the hems, after sealing of the hems, or after having folded the flat sheet.

Should I so desire I can start with folded material, send same through formers or baffle to form the hems and from this point on use the same procedure as outlined.

Referring to the drawings, FIGS. 1-5 show various stages in the formation of a bag 30 which is shown in greater detail in FIGS. 6-8. Referring more particularly to FIG. 1, a web or bag strip 21 of polyethylene sheet material is shown advancing in the direction indicated by an arrow 22. As the web advances continuous strings 23 and 23' are positioned adjacent the longitudinal edges 24 and 24' of the advancing web and these edges are folded over the strings about four lines indicated by 25 and 25'. The folded over edges 24 and 24' are then heat sealed to opposed portions of the web as indicated by seal lines 26 and 26' to form tubular hems 27 and 27' containing the strings 23 and 23' and forming the longitudinal margins of the web. The web 21 may then be folded about a longitudinal fold line 25 to bring the tubular hems 27 and 27' into opposed relation and to form a folded web or bag strip as shown in FIGS. 2 and 3. If desired, the fold about the line 25 may be gusseted so as to produce a bag having a gusseted bottom.

During the positioning of the strings 23 and 23' and the subsequent folding and sealing operations described above the web 21 is preferably maintained under tension so that it is stretched longitudinally. The strings 23 and 23' are preferably positioned in a substantially unstretched condition. After folding as shown in FIGS. 2 and 3 the web is still stretched longitudinally while the strings 23 and 23' are crimped. Tightly unwound in a reverse roll unwinding manner and then severed and sealed along transverse seal lines such as 29 (FIG. 2) to form individual bag segments such as 30 having sealed side margins such as 32 and 32' as shown in FIGS. 4 and 5. During this severing operation the material of the web including material of the hems 27 and 27' surrounding the strings 23 and 23' is severed without severing the strings. Either immediately before or during the severing step the tension on the web 21 is released so that the material of the web may contract longitudinally to its unstretched condition. This contraction of the web material following release of the longitudinal tension results in lengths of the strings 23 and 23' being exposed between the various bag segments 30 as indicated at 31 in FIG. 4.

The length of string exposed between the adjacent bag segments by the contraction of the material of the bag strip varies depending upon the particular material used and the tension under which it was maintained during the earlier portions of the process, but in the average case may be about between ⅛ inch and ¾ inch or more. In addition, loss of material due to melting during the heat sealing and severing of the strip into bag segments may increase this distance by a small amount such as about ¼ inch.

Following the severance of the web 21 into bag segments 30 as described above the strings 23 and 23' of the respective bag segments are fastened together by stapling outside the respective side edges 33 and 33' of each bag segment. This is best shown in FIG. 5 in which staples 33 and 33' are shown connecting the strings between adjacent bag segments. The strings may then be severed between each pair of staples 33 and 33' as indicated by lines 34 in FIG. 5 to form the finished bags 30 as shown in FIGS. 6-8. These bags may be of any suitable size. For instance, bags measuring 15 inches by 10 inches may be formed from a web of bag material measuring 33 inches wide by folding about ⅛ inches of the web material over string means along each longitudinal margin of the web to form tubular hems as described above and then severing the bag material transversely at intervals of about 10 inches.

If desired, in order to provide greater lengths of exposed strings between the adjacent bag segments than are obtainable as described above, the bag segments may be further separated as by accelerating the advance of each segment with respect to the segment behind it immediately prior to fastening the strings. This will expose even more string between each bag segment and the succeeding bag segment especially if the string has been fed into position on the advancing web faster than the rate of advance of the web.
If desired, bags manufactured as outlined above may be provided with openings in the form of holes, slits, etc. at suitable intervals in the tubular hems forming the lip of the bag as shown in FIG. 9. For example, application Serial No. 751,700 filed July 29, 1955, issued as Patent No. 3,010,640 for "Draw String Bag." Such openings may be formed in any suitable manner but are preferably formed by punching or otherwise forming them in the tubular hems of the web of bag material after the edge portions of the hems have been folded over the string means as described above. If it is desired to shift the position of the string means in the hems either prior to or after forming openings in the hems, this may be done by the use of rollers similar to conventional toe in rollers or by other suitable guiding means.

Referring now to FIGS. 9-20 and more particularly to FIG. 9, apparatus is shown for producing draw string bags including bags of the type described above. This apparatus will be described with reference to the production of bags such as that shown in FIGS. 6-8 by the process described in connection with FIGS. 1-5. As shown generally in FIG. 9, the web 21 of polyethylene sheet material is drawn from a feed roll 41 and passes under a guide roll 42 and around the rolls 43 and 44 of a butterfly 45. The butterfly 45 is of a conventional type and is adapted to eliminate any slack in the web and to maintain the desired tension in the web as it advances through the apparatus. After passing around the butterfly 45 the web then passes over other guide rolls such as 46 and 47 and under a stationary forming roll 48.

As best shown in FIGS. 10 and 11 each end of the forming roll 48 is provided with a circumferential grooved portion 49 and each grooved end of the forming roll has a segment removed therefrom to leave a flattened portion as indicated at 50. As shown in FIGS. 9, 10 and 11 the strings 23 and 23' may be fed from spools 51 and 51' so as to pass around the grooved ends of the forming roll 48 for positioning adjacent the longitudinal edges of the web 21. As best shown in FIGS. 10 and 11 the grooved portions 49 of the ends of the forming roll 48 provide guide means for guiding the strings 23 and 23' into position along the edges 24 and 24' of the web. Other suitable means for guiding the strings into position could of course be used without departing from the spirit of the invention.

The forming roll 48 is shorter than the original width of the web 21 so as to provide forming means for forming a fold near each edge of the web. As shown in FIGS. 10 and 11 the outer edges of the flattened areas 50 are preferably so positioned that their corners 52 provide forming guides for initiating folds along the fold lines 25 and 25' adjacent the edges 24 and 24' respectively of the advancing web.

Since the material of the web 21 does not score in the manner of paper when passing over a corner such as 52, a folding guide is provided for folding the edges of the web over the strings along each longitudinal margin of the bag. As shown in FIGS. 10 and 12 each of these folding guides may take the form of a guide wire 56 which may be secured to any suitable portion of the frame of the apparatus such as a frame member 57 as by a set screw 58. The guide wire 56 has a portion 59 adapted to fold the edge 24 of the web over the string 23 as the web advances past the portion 59 of the guide wire. It can thus be seen that the corner 52 of the forming roll 48 and the guide wire 56 cooperate to form the fold line 25 and fold the edge 24 of the web over the string 23 about the fold line 25.

If desired, conventional toe in rollers such as roller 61 shown in FIG. 13 may be used at any suitable point in the process to insure that the web 21 does not contract transversely as a result of the longitudinal tension employed or for any other reason. Such rollers are well known in the art and, as shown in FIG. 13, roller 61 is rotatably mounted on a shaft 62 which is rotatably supported about a fixed shaft 63 by means of a suitable connecting member 64. The shaft 63 is in turn secured to a suitable frame member 65 as by a set screw 66. The toe in roller 61 cooperates with a guide roll 67 in forming the longitudinal edges of the advancing web outwardly as indicated by an arrow 68.

The folded over edge portions 24 and 24' of the web 21 are sealed to opposed portions of the web by conventional heat sealing apparatus shown in FIG. 9 as heat sealing bars 71 and 71' which are suitably mounted for reciprocal movement on vertical guide members 72 and 72' which are operated in a conventional manner by eccentric means associated with a driven shaft 73. The advance of the web may, if desired, be interrupted periodically in order to allow the proper operation of the sealing bars 71 if such an interruption is required or, if the construction and operation of the sealing bars allows, the advance of the web may be continuous. In the particular embodiment shown the advance of the web is intermittent in order to allow sealing and severing transversely as described below but it should be understood that such sealing and severing equipment might also be designed to operate continuously and to allow continuous rather than intermittent advance of the web.

Following heat sealing of the edges 24 and 24' to opposed portions of the web by the sealing bars 71 and 71' the folded over portions of the web form the tubular hems 27 and 27' as described above in connection with FIG. 1. The web may then be folded about the central fold line 28 as shown in FIGS. 2 and 3 above by passing it over a conventional V board 74 as shown in FIGS. 9, 10 and 11. The V board 74 includes frame members 75 and 75' arranged in a V shape. The web 21 is pulled over a guide roll 76 at the upper end of the V and down and around the V by a pair of pinch rolls 77 and 77' located at the bottom of the V and driven by suitable means so as to pull the web at the desired speed. The rolls 77 and 77' are arranged parallel the original direction of movement of the web 21 and cooperate with the V board 74 to fold the web 21 about the central fold line 28 so as to bring the tubular hems 27 and 27' into opposed relation. An arrow 78 in FIG. 14 indicates the direction of movement of the web 21 before it reaches the V board 74 while an arrow 79 indicates the direction of movement of the folded web after it has passed over the V board and through the pinch rolls 77 and 77'.

After leaving pinch rolls 77 the folded web is drawn by a pair of pinch rolls 78 and 78' (FIG. 9) over a series of guide rolls 80-85. If desired some of these guide rolls may be arranged in a butterfly arrangement similar to the butterfly 45 described above in order to maintain proper tension in the web and to eliminate any slack therein.

As best shown in FIGS. 15 and 16 means is provided just beyond the pinch rolls 78 and 78' for severing the material of the web including the hems containing the strings 23 and 23' transversely at bag width intervals to form bag segments connected only by the unsevered strings 23 and 23'. This severing means is shown in the form of a sealing wire 87 shown schematically in FIG. 9 and shown in greater detail in FIGS. 15, 17 and 18. Arrows 79a in FIGS. 15 and 16 indicate the direction of advance of the web 21. The sealing wire 87 is a conventional thermal sealing wire such as is commonly used to sew multiple plies of polyethylene or the like and simultaneously seal the plies together adjacent the line of severance. As shown in FIG. 15 the sealing wire 87 may be a conventional electrical resistance heating wire supplied with electricity from a suitable source such as indicated at 87a and is carried on the end of a sealing bar 88 which is supported by suitable frame members indicated as 89 in such a manner that the sealing wire 87 may be periodically brought into proximity with a supporting plate 90 adapted to support the web while the same is being severed. Suitable driving apparatus indicated generally
at 91 is provided for bringing the sealing bar 88 into sealing position at appropriate intervals depending upon the speed of advance of the web 21 and the width of the bags desired. Means in the form of a blower 86 (FIG. 9) may be provided for directing air across the web 21 and sealing wire 87 during the sealing and severing operations to prevent undesirable sticking of the polyethylene material.

The operation of the sealing wire 87 may be more completely understood by reference to FIGS. 17–20 from which it can be seen that the supporting plate 90 has a notch 91 in its edge. The notch 91 is positioned so as to receive the cords 23 and 23' as shown in FIG. 19 so as to thereby protect the cords from being severed by the sealing wire 87 when the same comes into close relation with the edge of the supporting plate 90 to sever the material of the web 21. The supporting plate 90 may be covered with a sheet of insulating material 90' in the conventional manner and, if desired, the insulating material may be cut away in the vicinity of the notch 91 in order to facilitate severing the material surrounding the strings 23 and 23'.

It is apparent that, since material of the bag strip 21 completely surrounds the strings 23 and 23', difficulty may be experienced in completely severing the bag material with the severing wire 87 while the strings 23 and 23' are recessed in the notch 91. In order to assist in severing the bag material surrounding the string, it is preferred to heat the supporting plate 90 in the vicinity of the notch 91 to a temperature of about 700° F, while the heated portion of the plate 90 except in conjunction with the severing and sealing operation of the sealing wire 87. The sealing wire 87 and the heated portion of the supporting plate 90 may be maintained at any suitable temperature. In the specific example shown the sealing wire 87 is preferably maintained at a temperature of about 700° F, while the heated portion of the plate 90 is preferably maintained at a temperature of about 120° F. It should be understood that any suitable means of heating the sealing wire 87 and the portion of the supporting plate 90 in the vicinity of the notch 91 may be used without departing from the scope of the invention.

Severing the material of the bag strip without severing the strings in the manner just described separates bag segments such as 30 from the web. These segments are connected together by continuous portions of the strings 23 and 23' as described above in connection with FIGS. 1–8. These bag segments may then be formed into completed bags by fastening the strings and severing the same in the manner described above and it is contemplated that any suitable apparatus may be employed for this purpose.

For instance the bag segments might be advanced while conventional stapling guns fire staples into the strings at appropriate points. The strings might then be cut by any conventional cutting knife between adjacent pairs of staples intermediate the bag segments. Alternatively, a single staple head designed to fire two staples in close proximity to each other may be used and a suitable knife for severing the strings between each pair of staples may be included in such stapling head or may cooperate with such stapling head in fastening and severing the strings.

The apparatus described above is capable of producing draw string bags at much higher rates of speed than have been possible previously. The number of bags produced in a given time obviously depends largely on the size of the bags but the web of bag material may be advanced at any suitable rate ranging from comparatively slow speeds such as about 30 ft./min. up to faster speeds such as about 200 ft./min. and even faster rates of advance are contemplated.

While the invention has been described in detail with respect to certain preferred embodiments, it will be understood by those skilled in the art that various modifications may be made without departing from the spirit and scope of the invention and it is intended to cover all such changes and modifications in the appended claims.

I claim:

1. A method of making draw string bags which comprises advancing a web of flexible heat sealable material, positioning string means along said advancing web adjacent at least one longitudinal margin thereof, severing said edge of the advancing web over said string means, sealing said edge to opposed portions of the web to form a tubular hem containing said string means along a longitudinal margin of the web, folding the web along a longitudinal line to bring the opposite margins thereof into opposed relation, severing said material of said folded web including material of said hem surrounding said string means transversely at bag width intervals to form successive bag segments, separating the forward edge of said web from the rear edge of a severed segment to provide a space therebetween and thereafter severing said string means between the forward edge of said web and a rear edge of a severed segment.

2. A method of making draw string bags which includes the steps of: advancing a web of flexible heat sealable plastic material, positioning strings along said advancing web adjacent the longitudinal margins thereof, folding said edges of the advancing web over said strings, heat sealing said edges to adjacent portions of the web to form tubular hems containing said strings along the longitudinal margins of the web, folding the web along a central longitudinal foldline to bring the opposite marginal hems thereof into opposed relation, severing said material of said folded web including said hems surrounding said strings transversely at bag width intervals to form successive bag segments, separating said forward edges of said web and then severing said intermediate points spaced at bag width intervals to provide a space therebetween, fastening the strings of said adjacent bag segments together at closely spaced points within said spaced portions of said strings by means of a stapler.

3. A method of making draw string bags from a bag strip having oppositely disposed front and back panels of heat sealable flexible plastic material connected together along one longitudinal margin of the web, in which opposed sides of the web bounding longitudinal edges of said panels form the other longitudinal margin of the strip with at least one of said edge portions comprising a tubular hem containing draw string means which includes the steps of: introducing and positioning the material of said bag strip including said hem surrounding said bag strings transversely at bag width intervals, separating the said edges to provide a space therebetween and thereafter severing said string means within said space.

4. In the manufacture of draw string bags of flexible heat sealable plastic material from a bag strip having a tubular hem containing string means the steps which include severing said bag strip including the material of said hem surrounding said string means contained therein at intervals while leaving said string means intact, separating the said edges to provide a space therebetween and thereafter severing said bag strip.

5. A method of making draw string bags including the steps of advancing a web of flexible heat sealable plastic material having elastic properties under tension whereby said material is stretched longitudinally, positioning string means along the advancing web adjacent at least one longitudinal edge thereof, folding said edge of the advancing web over said string means, heat sealing said edge to
adjacent portions of the web to form a tubular hem containing said string along a longitudinal margin of the web, folding the web longitudinally to bring the longitudinal margins thereof into opposed relation, severing said folded and longitudinally stretched web including said tubular hem transversely at bag width intervals to form bag segments while leaving said string continuous between said web and successive severed segments respectively thereby releasing the tension on said bag segments and allowing the material of said bag segments to return to its undeformed condition thereby exposing said string between said segments.

6. A method of making draw string bags from a bag strip of longitudinally stretched flexible heat sealable plastic material having elastic properties and having front and back panels connected along a longitudinal margin of the strip, the other longitudinal margin of the strip being formed by opposed tubular hems of said panels respectively, each of said hems containing a substantially unstretched string, which includes the steps of advancing said bag strip under tension, severing the material of said strip including material surrounding said strings at bag width intervals to form bag segments while leaving said strings continuous between said web and successive severed segments respectively and allowing the material of said segments to contract longitudinally to its undeformed condition and expose lengths of said strings between adjacent segments, fastening said strings together transversely spaced points intermediate said adjacent segments and thereafter severing said strings intermediate said points.

7. A method of making draw string bags of a flexible heat sealable plastic material having elastic properties from a web of such material having a longitudinal tubular hem containing said string means, which includes the steps of stretching said web longitudinally relative to said string means contained in said tubular hem, thereafter severing the material of said web including said hem surrounding said string means to form bag segments while leaving said string means continuous between said web and successive severed segments respectively whereby the material of said segments contracts longitudinally to its prestretched condition exposing lengths of said string means between said segments, and thereafter severing said string means intermediate said segments.

8. A method of making draw string bags of a flexible, heat sealable material having elastic properties which includes the steps of forming a longitudinally stretched web of such material having a longitudinal tubular hem containing substantially unstretched continuous string means, severing the material of said web including said hem surrounding said string means to form bag segments while leaving said string means continuous between said web and successive severed segments respectively and allowing the material of said segments to contract longitudinally to its prestretched condition thereby exposing lengths of said string means between said segments, and then severing said string means intermediate said segments.

9. Apparatus for making draw string bags comprising means for advancing a web of flexible, heat sealable material having elastic properties under sufficient tension to substantially stretch said web longitudinally, a string guide for positioning substantially unstretched string means along an edge of said advancing web, a folding guide for folding said edge of the advancing web over said string means, means for heat sealing said edge of the web to opposed hems of said web and successive severed segments respectively and allowing the material of said segments to contract longitudinally to its prestretched condition thereby exposing lengths of said string means between said segments, and then severing said string means intermediate said segments.

10. Apparatus for forming draw string bags comprising means for forming flexible, heat sealable material having elastic properties into a bag strip having a longitudinally substantially stretched tubular hem containing substantially unstretched string means, and means for transversely severing the substantially stretched material of said strip including said hem surrounding said string means at bag width intervals to form bag segments, said severing means including means for leaving the string means continuous.

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