Jan. 8, 1952 S. G. YOUNT 2,581,826

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Original Filed Aug. 9, 1946 3 Sheets-Sheet 1

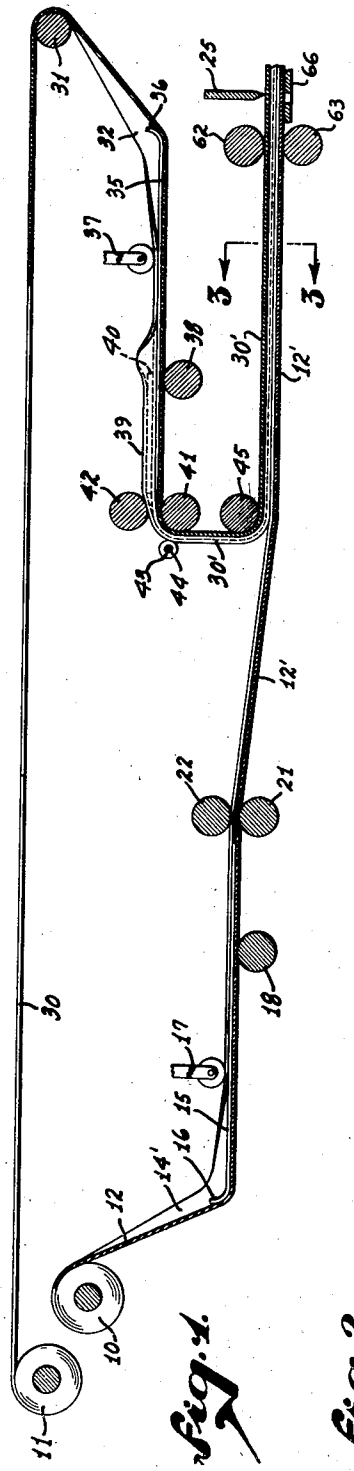


Fig. 1.

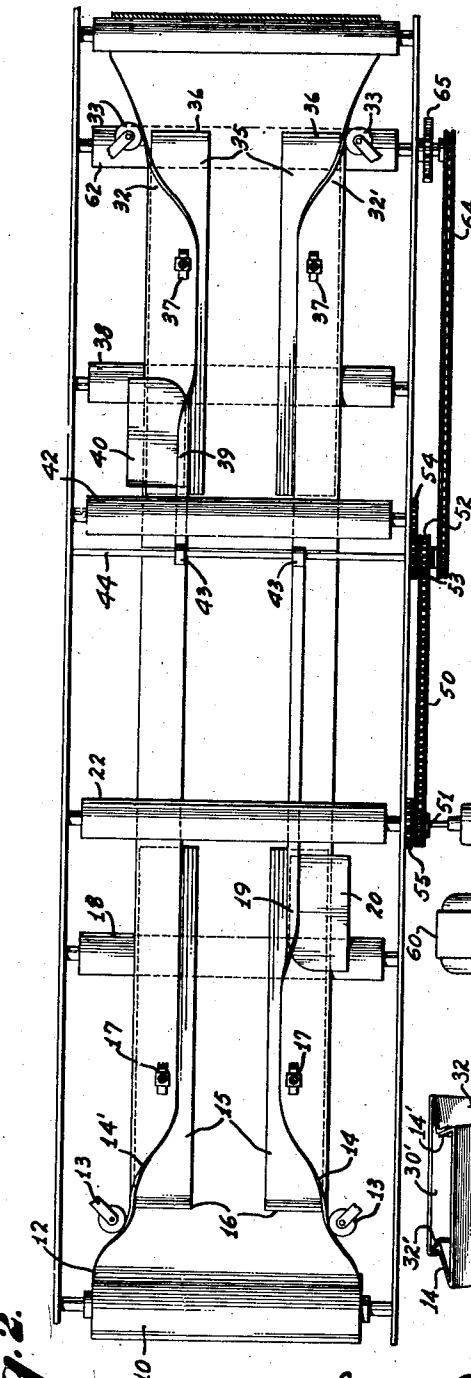


Fig. 2.

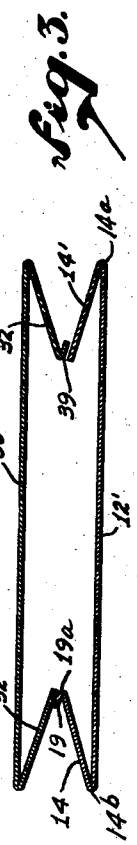


Fig. 3.

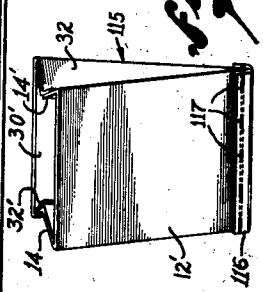


Fig. 4.

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Original Filed Aug. 9, 1946 3 Sheets-Sheet 2

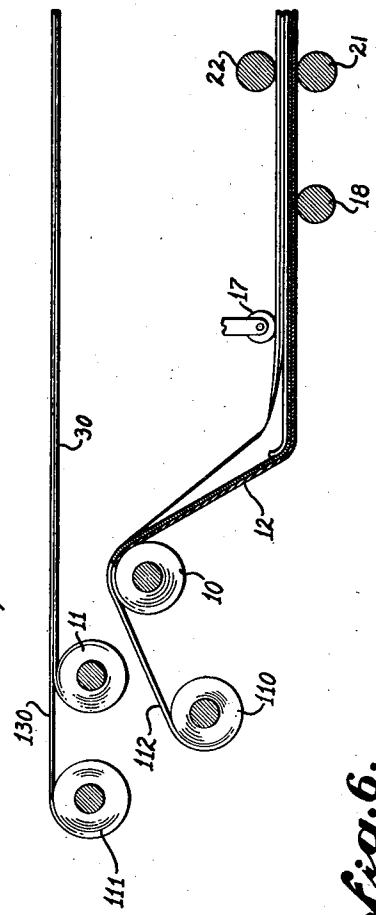


Fig. 5.

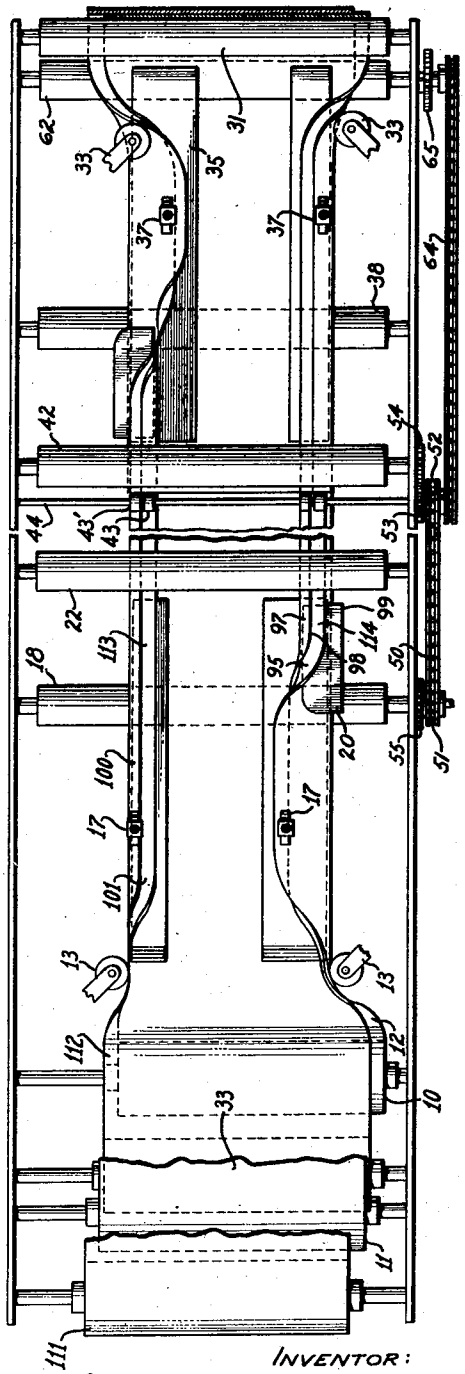


Fig. 6.

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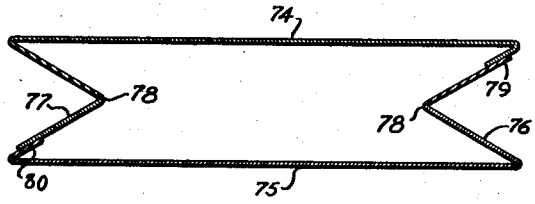


Fig. 7.

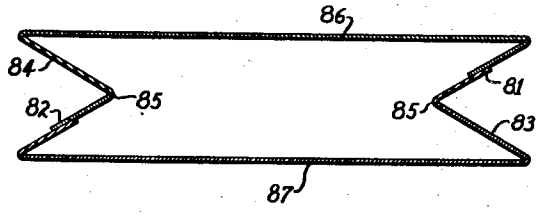


Fig. 8.

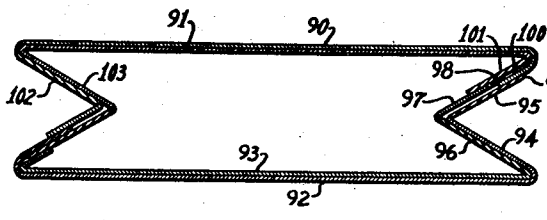
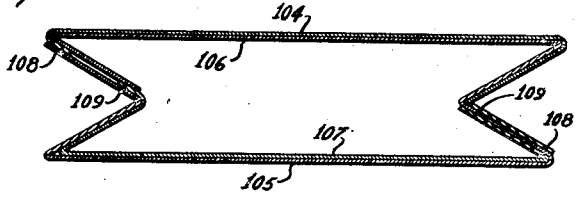


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE

2,581,826

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Stanley G. Yount, Los Angeles, Calif.

Original application August 9, 1946, Serial No. 689,565. Divided and this application September 29, 1947, Serial No. 776,749

3 Claims. (Cl. 229—53)

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This invention relates to the manufacture of paper bags and is particularly adaptable to the production of large circumference, heavy bags suitable for covering items such as divans and arm-chairs, also for lining boxes, cartons, etc. The invention is also applicable to bags of other sizes and is adaptable to either single-walled or multi-walled bags.

A very large pleated type bag best exemplifies the invention as there is a substantial need for such bags, particularly of a construction which can be employed in covering divans, arm-chairs and other similar articles of furniture for shipping and storing, bags for this purpose having been of a different construction than that which characterizes the present invention.

The bags, previously made by hand, for the purpose of covering divans, chairs and the like have more or less conformed to the general outline of such articles of furniture, being inverted over the same, and are satisfactory except from the standpoint of manufacture, being necessarily made by hand and involving a relatively costly method.

The objects and purposes of the invention will become more apparent when it is considered that the jumbo roll is the largest unit of paper commercially employed for automatic or continuous processing. It has been found by experience to be the largest and heaviest paper roll unit which can be satisfactorily handled by standard equipment. Considering further that the conventional method of fabricating bags is to fold paper longitudinally as it comes from a roll, which reduces the circumference of the bag tube to something less than the width of the paper, depending upon the bag construction, it has never been possible to manufacture the largest bags of the character described above from a single roll for the simple reason that it is not practical to handle such a wide jumbo roll even if it could be produced under known manufacturing methods.

The present application is a division of copending application, Serial No. 689,565, filed August 9, 1946, now Patent No. 2,511,031.

Among the objects of the invention is to provide a new and improved bag of a type particularly well suited for manufacture in large sizes.

Another object of the invention is to provide a new and improved paper bag wherein companion sheets of material of uniform identical width and length are joined together so as to provide a paper bag of maximum size while efficiently and effectively utilizing said material.

Still another object is to provide a new and improved paper bag adapted to be made in exceptionally large sizes and of multiple wall construction wherein more than one width of paper of maximum roll width is employed.

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Still further among the objects of the invention is to provide a new and improved bag of construction adapted to utilize more than one width of so styled "jumbo" paper rolls, the paper being applicable in a plurality of plies and so arranged that an excess of thickness is not accumulated in one area.

This invention contemplates a paper bag for articles of large size including front and rear walls and pleated side walls. The paper bag of this invention may be made from at least one pair of companion sheets of material, said sheets being of uniform and identical width and length and having straight unbroken longitudinal edges and transverse end margins. Each sheet includes an infolded longitudinally extending narrow panel of uniform width provided along one longitudinal margin of a sheet, an infolded longitudinally extending wide panel provided along the opposite longitudinal margin of the sheet, said wide panel having an outfolded sealing strip of uniform width coextensive in length with the wide panel and the narrow panel. The sheets of a companion pair may be superposed with transverse margins in opposed and aligned relation and with the sealing strip of each sheet in adhesive engagement with the entire length of the narrow panel of the companion sheet.

An additional object of this invention is to design and provide a paper bag wherein companion sheets of material of identical width and length are each provided with panels extending along opposite longitudinal margins of the sheet and coextensive in length, one panel being narrow and the other panel being wide, the wide panel having a sealing strip coextensive therewith and cooperable with the narrow panel of the companion sheet for adhesive engagement therewith.

With these and other objects in view, the invention consists in the construction, arrangement and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in the claims and illustrated in the accompanying drawings, in which:

Figure 1 is a side sectional view showing a schematic representation of parts of an apparatus upon which the novel bag may be made.

Figure 2 is a top view of the apparatus shown in Figure 1 with the upper strip of paper partially removed.

Figure 3 is a cross-sectional view of the tube of paper made by the machine taken on the line 3—3 of Figure 1.

Figure 4 illustrates a bag which may be formed from a gusset tube made in accordance with the invention.

Figure 5 is a diagrammatic, elevational view of the feed end of a machine set up for making bags of two-ply wall thickness.

Figure 6 is a foreshortened plan view of the machine showing an arrangement utilizing offset rolls for making a tube having a two-ply construction.

Figure 7 is a cross-sectional view of a bag tube made according to my invention in which the seams instead of being along the center fold of the pleated side wall are located along diametrically opposite edge folds.

Figure 8 is a cross-sectional view of another modified bag tube produced by my invention in which the seams are midway between the center fold of the pleated side walls and the edge fold.

Figure 9 is a cross-sectional view of a multi-walled bag tube produced by my invention.

Figure 10 is a view similar to Figure 9 in which the seams of a double-walled bag are distributed at different locations.

One of the chief difficulties in making paper bags of exceptional circumference is to be able to handle rolls of paper stock which have sufficient width from which to form the bag. There are occasions where paper bags of exceptional circumference are greatly in demand. The manual operations previously referred to for making such paper bags are slow, costly and inefficient and cannot be counted upon to produce a consistently good product under all circumstances. Consequently, if large paper bags are to be provided at a cost which will permit them to be used extensively, some means must be provided whereby they can be made economically. Whatever means is selected must further take into consideration the fact that large bags must usually be made of heavy stock and for many purposes must be adapted to utilize two or three plies or walls so that the resulting product will have sufficient strength. This requires that the process must be a simple one involving relatively few folds and few operations.

To illustrate the manufacture and production of a novel bag of a type embodying the invention an apparatus has been devised which is capable of producing an acceptable bag by the use of relatively few rolls and without the use of numerous special features which have been incident to processes of a similar kind in the past. In the drawings there is illustrated diagrammatically the location of two rolls 10 and 11 of paper stock. Although for convenience in illustration two rolls only are shown, it will readily be appreciated that for multiple ply tubes the paper for each half of the tube may be taken from separate rolls and brought together in the machine prior to folding, the different rolls being offset the required distance to provide the necessary staggering of the seams, as will be subsequently described.

In the example chosen for illustration paper is drawn from the roll 10 in the form of a sheet 12 which is directed downwardly, as shown in Figure 1, and during its downward course is deflected inwardly by a deflecting roll 13, frequently designated as a tucker roll, on each side, the deflecting rolls being mounted upon a vertical axis and being shown diagrammatically only in Figure 2. The deflecting rolls are adapted to form folds 14 and 14' on opposite sides of the sheet.

In order to properly locate and crease the folded-over margin portion, there are provided folding guides 15 on each side which are suitably supported by convenient means inside the actual margins of the sheet or strip of paper. Curved ends 16 guide the paper into a proper position for completing the fold.

As the paper passes over the folding guides it is rolled or ironed down by means of rollers or tucker rolls 17, one located on each side. A supporting roll 18 holds the paper upwardly against the bottom of the folding guides.

It should be noted that the fold 14 is preferably made slightly wider than the fold 14'. The extra width is to provide for a certain amount of paper to comprise a turned-back edge 19. For turning back the edge there is provided a turn-back guide 20 on one side only of the apparatus, namely, the near side as viewed in Figure 2.

As the folded sheet or strip of paper comes off the guides the folds are pressed firmly together by suitably driven ironing rolls 21 and 22. The folded sheet designated by the reference character 12' then passes under the remaining portion of the machine to a cutter 25. By drawing the turned-back edge 19 between the rolls 21 and 22 a sufficient deflection is made possible to stretch the edge satisfactorily against the turn-back guide 20.

At the same time as the sheet 12, 12' is being formed a companion sheet or strip of paper 30 is being led from the roll 11 across the top of the machine to an idler roll 31 at the extreme right-hand end. The sheet 30 is reversed in direction by the idler roll and passed downwardly at an angle where folds 32 and 32' are formed at the margins by folding rolls 33 similar in relative location and function to the rolls 13 previously described. Folding guides 35 perform a function similar to the guides 15 and are similarly provided with curved ends 36.

After the folds 32 have been made, they are pressed downwardly by the rollers 37, one located on each side. A supporting roll 38 similar to the roll 18 is also provided.

In this instance the fold 32 is slightly wider than the fold 32' so as to provide enough material for a turned-over portion 39. It should be noted particularly, however, that the turned-over portion 39 is located upon the opposite side of the machine from the turned-over portion 19. A turn-back guide 40 is utilized for this portion of the operation. Ironing rolls 41 and 42 press the folds of the sheet together after it passes from the turning guides completing the formation of a folded sheet 30'.

Immediately following passage of the sheet 30' of folded paper from the ironing rolls adhesive applicators 43, which may be in the form of rolls mounted upon a shaft 44, are located so as to apply adhesive in one case to the outer face of the turned-over portion 39 and in the other case to the inside edge of the fold 32'.

The sheet 30, 30' then passes downwardly around an idler roll 45 which directs it into contact with the folded sheet 12'. The arrangement of rolls may be such that the folded companion sheets 30' and 12' are pressed against each other so that the adhesive applied to the folds of one of them is made to stick to complementary folds of

the other. The relationship of the two sheets following the adhesive or gluing operation is illustrated graphically in Figure 3. Figure 3, however, shows the sheets distended one from the other for the purpose of illustrating the location and character of the folds rather than being pressed tight against each other as would actually be the case immediately after passage of the sheets over the roll 45.

By way of example, a motor 60 is illustrated as having a drive connection 61 to the shaft of the roll 22. Rolls 22 and 21 may, if desired, be geared together by a gear chain 55. A sprocket 51 is shown on the shaft of roll 22 around which is a chain 50 passing also around a sprocket 52 on the shaft 44. A gear chain 53, 54 may inter-connect, respectively, shaft 44, the roll 41 and the roll 42, so that each of the respective shafts rotate in the proper direction relative to movement of the paper. Final pull rolls 62 and 63 may be connected to the shaft 44 by a chain 64, the rolls being inter-connected by a set of gears 65. Paper then is pushed over a table 66 whereon it is sheared off to size by the cutteer 25.

Figs. 3 and 4 illustrate two views of a completed paper bag formed by adhesively securing a pair of companion sheets of material folded as above described. It will be noted that the paper bag is provided with front and rear planar walls and pleated side walls. The fold 14' provides a narrow panel extending continuously along one longitudinal margin of sheet 12', said panel being of uniform width for the entire length of the sheet. The fold 14' is defined by the longitudinal marginal edge of the sheet and a first longitudinally extending parallel fold line 14a. The fold 14 provides a wide panel extending continuously along the opposite longitudinal margin of the sheet, said wide panel being of uniform width throughout the length of the sheet and defined by a second fold line 14b parallel to the adjacent edge of the sheet. The wide panel is provided with a third fold line 19a parallel to the adjacent edge of the sheet and defining therewith a continuous longitudinally extending sealing strip or turned-back portion 19 of uniform width throughout its length and coextensive with the wide panel 14. The companion sheet 30' is formed virtually identically with said sheet 12'.

The companion sheets 12' and 30' are thus provided with identical panels, sealing strips and fold lines.

As shown in Fig. 3 the sheets of a companion pair are adhesively secured to each other in superposed relation with the sealing strip of each sheet in adhesive engagement with the entire length of the narrow panel of the companion sheet. When in superposed relation, the transverse margins of each sheet are in opposed and aligned relation. At one end of the paper bag the transverse margins are secured in suitable manner as shown in Fig. 4 for closing one end of the bag.

While the paper bag illustrated in Fig. 3 shows each sealing strip secured to the narrow panel of the companion sheet adjacent to the longitudinal center of the pleated side wall, it may be desirable in certain bag constructions to modify the width of said panels and sealing strips so as to provide a sealing strip secured to an opposed narrow panel at other points along the pleated side wall.

An arrangement of the apparatus making possible the formation of tubes wherein the seams are located elsewhere than at the center fold of the pleated wall is illustrated in Figures 5 and 6. These tubes in addition illustrate the formation of tubes of multiple walls. The offsetting of the rolls of paper in Figures 5 and 6 is purely by way of example as it will be understood that offsetting to a different extent of the various rolls may be utilized in order to form tubes wherein the seams are located at various positions along the pleated wall.

Figure 5 shows the left end portion only of an apparatus similar to that described in connection with Figure 1 wherein two sets of rolls provide paper for the wall of each side of the bag. In Figure 5 a supporting roll 18 is located in the same manner as described in connection with Figure 1 as are also the ironing rolls 21 and 22. The roll of paper 10 in the example of Figure 5 is augmented by the presence of a second roll of paper 110 spaced a short distance from the roll 10. A sheet 112 of paper from the roll 110 passes around the roll 10 joining the sheet 12, and both sheets together are folded by the tucker rolls 13 and 17.

In this instance, however, the rolls 10 and 110 must be offset with respect to each other as best illustrated in Figure 6. This is necessary in order to provide an exposed portion 113 of the sheet 112 and a corresponding exposed portion 114 of the sheet 12. The folds illustrated in Figure 6 may be readily compared with corresponding folds and edges illustrated and identified in Figure 10.

In order to form the opposite side of the bag, the roll 11 of paper must be augmented by the addition of another roll 111. A sheet 130 of paper from the roll 111 joins the sheet 30 of paper from the roll 11 as the sheets pass over the top of the machine to the opposite end where they are folded by the use of the tucker rolls 33 and 37 in conjunction with the folding guides 35 and turnback guide 40 as was described in connection with Figures 1 and 2.

In the last instance rolls 11 and 111 must be offset with respect to each other by substantially the same amount as the rolls 10 and 110 are offset with respect to each other. In addition to offsetting the rolls of each set, namely, the set consisting of rolls 11 and 111 and the set consisting of rolls 10 and 110, one set must be offset with respect to the other set as is likewise aptly illustrated in Figure 6. The offsetting of the sets of rolls is required in order to provide a wide panel one one side for the rolls of one set and on the other side for the rolls of the other set, the necessity for this being illustrated particularly well in Figure 10.

In the case where a tube is formed of double wall thickness adhesive applicators 43' and 43'' must be installed on both sides of the machine mounted upon the shaft 44 so that a strip of adhesive is applied to each ply for causing it to adhere to a corresponding portion of the ply forming the opposite side of the bag. In other respects the machine illustrated in Figures 5 and 6 contains the same essential features as the machine described in Figures 1 and 2. Conventional means of a well-known sort may be used to adjust the rolls to their proper offset position, these means being omitted for the sake of clarity.

By way of example, in Figure 7 there is illustrated a tube comprising front and rear walls 74 and 75 having side walls 76 and 77 wherein the seam is located at a position remote from center fold line 78 of the side walls. The wide panel 76 has a sealing strip 79 located near the top; whereas, a sealing strip 80 for the side wall 77

is located near the bottom. By forming the pleated side walls in the manner shown in Figure 7, the walls may be printed upon easily and conveniently in a manner which would not be possible if the side walls were provided with seams near the center fold.

In order, however, to make a tube of the type shown in Figure 7, the roll of paper forming the wall 74 would have to be offset with respect to the roll of paper forming the wall 75 by an amount approaching the full width of the wide panels.

Another variation is shown in Figure 8 wherein seams 81 and 82 in respective pleated side walls 83 and 84 are located intermediate center folds 85 and the adjacent corners of walls 86 and 87 respectively.

Figure 9 illustrates a tube similar to the tube of Figure 7 but shows a tube having a double wall thickness or in other words a two-ply bag. As shown, the tube for forming a two-ply bag has outer and inner walls 90 and 91, respectively, forming one side of the bag and outer and inner walls 92 and 93, respectively, forming the other side of the bag. The wall or ply 92 has a wide panel 94, a sealing strip 95 of which is folded back upon itself for a width almost equal to the initial fold. The wall or ply 93 has a similar wide panel 96 likewise with a sealing strip 97 folded back upon itself but terminating along an edge 98 spaced inwardly from an edge 99 of the back folded sealing strip 95. This leaves an exposed margin of the back folded sealing strip 95 to which glue may be applied.

The wall of ply 90 has one short fold 100 which is adapted to contact the back folded portion 95 and be joined thereto, making a seam near the edge of the pleated wall. The wall or ply 91 has a longer fold 101, long enough to reach over the back folded portion 97 and to be attached thereto.

On the opposite side of the tube the outer and inner walls form outer and inner wide panels 102 and 103 but with the overlapping of the folds arranged in slightly different order as is made necessary by the requisite staggering of the rolls of paper which form the bag in order to maintain a panel uninterrupted by a seam as is illustrated on the right-hand side of the tube.

Figure 10 shows still another form of two-ply tube having outer walls 104, 105, inner walls 106, 107, and seams 108 and 109 on each side, the outer seam 108 being near a corner and the inner seam near the center of the pleated wall.

It will be further appreciated that the location of seams can be modified by using rolls of paper of different width should occasion demand. Also, tubes may be made with panels of unequal depth in order to make odd shaped bags by resorting to a similar expedient of using rolls of paper of unequal width. A tube having perfectly smooth side walls uninterrupted by seams may be made following the pattern of Figure 10, if desired, so that the side walls of the bag may be properly printed upon.

After the tube has been formed conforming to any one of the cross-sections shown in Figures 3, 7, 8, 9, and 10, a bag 115 may be formed by closing one of the ends using a reinforcing strip 116 attached thereto by a line 117 of stitching. Other styles of attachment may, of course, be substituted for the stitching and reinforcing strip as occasion may suggest. The bag of Figure 4 presumes to use a tube of the cross-section shown in Figure 3.

The virtues of a bag constructed as herein described lie in the simplicity of arrangement of large elements making it possible by simple, rugged means to handle rolls of paper of exceptional width and exceptional weight. Although paper rolls of exceptional weight and width have been emphasized as important in the production of the invention, it is to be appreciated that occasions may arise where the bag may be constructed of light weight papers or rolls of lesser width.

Although the invention has been herein shown and described in what is considered to be the most practical and preferred embodiment, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent structures, processes and apparatus.

The invention having been herein described, what I claim as new and desire to secure by Letters Patent is:

1. A bag for articles of large size, said bag having front and back wall panels and pleated side walls, said bag being made from at least one pair of companion sheets of material, said sheets being of uniform and identical width and length and having spaced parallel, straight unbroken longitudinal edges and transverse margins; each sheet of a companion pair having (*a*) an infolded, continuous, longitudinally extending narrow panel of uniform width along the entire length of one longitudinal marginal edge of the sheet, said narrow panel being defined by such longitudinal marginal edge and a parallel first fold line; (*b*) an infolded, continuous, longitudinally extending wide panel of uniform width adjacent the entire length of the other longitudinal marginal edge of the sheet, said wide panel being defined by a second fold line, spaced from the first fold line and parallel thereto; (*c*) a third fold line adjacent the said other longitudinal marginal edge of the sheet; and (*d*) an outfolded continuous, longitudinally extending sealing strip of uniform width defined by said third fold line and other longitudinal edge of the sheet and coextensive therewith; the sheets of a companion pair being identical and adhesively secured to each other in superposed relation with transverse margins in aligned relation and with the sealing strip of each sheet in adhesive engagement with the entire length of the narrow panel of the companion sheet; and means connecting said companion sheets along transverse margins at one end of said sheets.

2. A bag for articles of large size, said bag having front and back wall panels and pleated side walls, said bag being made from a plurality of pairs of companion sheets of material, said sheets being of uniform and identical width and length and having spaced parallel, straight unbroken longitudinal edges and transverse margins; each sheet of a companion pair having (*a*) an infolded, continuous, longitudinally extending narrow panel of uniform width along the entire length of one longitudinal marginal edge of the sheet, said narrow panel being defined by such longitudinal marginal edge and a parallel first fold line; (*b*) an infolded, continuous, longitudinally extending wide panel of uniform width adjacent the entire length of the other longitudinal marginal edge of the sheet, said wide panel being defined by a second fold line, spaced from the first fold line and parallel thereto; (*c*) a

third fold line adjacent the said other longitudinal marginal edge of the sheet; and (*d*) an outfolded continuous, longitudinally extending sealing strip of uniform width defined by said third fold line and other longitudinal edge of the sheet and coextensive therewith; the sheets of a companion pair being identical and adhesively secured to each other in superposed relation with transverse margins in aligned relation and with the sealing strip of each sheet in adhesive engagement with the entire length of the narrow panel of the companion sheet; means connecting said companion sheets along transverse margins at one end of said sheets, the sheets of each pair being transversely offset with respect to the sheets of another pair while maintaining coincidence of fold lines between pairs of companion sheets.

3. A bag adapted for shipping of articles of large size, said bag being normally closed at one end, comprising: a tubular portion formed of at least two companion sheets of material, said sheets being of uniform and identical width and length and having parallel straight unbroken longitudinal edges, and transverse margins; each sheet having an infolded continuous longitudinally extending marginal panel along each side of said sheet, one panel having greater width

than the other panel, the wider panel on one side having an outfolded continuous longitudinally extending edge strip of uniform width coextensive with said panel; said companion sheets being superposed for forming said tubular portion, the outfolded strips of companion sheets to be secured together being disposed on opposite sides of the tubular portion, each strip having an outer face adhesively secured to the opposed inner marginal surface of the infolded panel of lesser width of the companion sheet.

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