Aug. 16, 1955 C. W. VOGT 2,715,493

CHAINED ENWRAPMENTS

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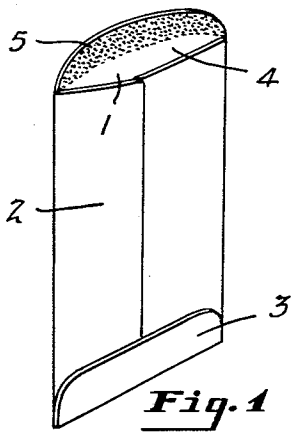


Fig. 1

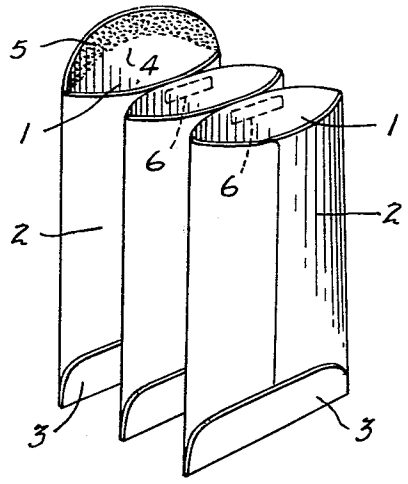


Fig. 2

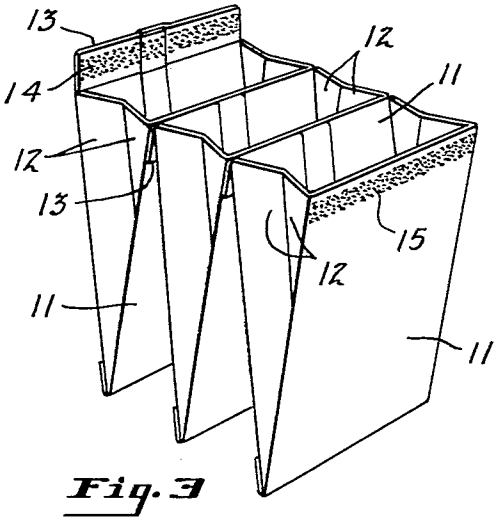


Fig. 3

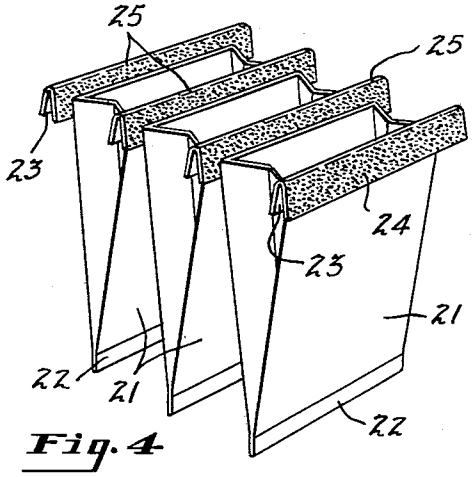


Fig. 4

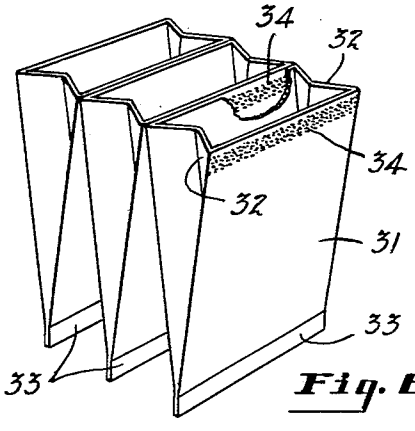


Fig. 6

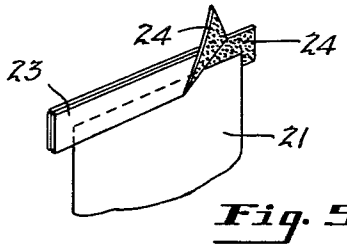


Fig. 5

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CHAINED ENWRAPMENTS

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6 Claims. (Cl. 229—69)

This invention relates to enwrapments and in particular to an assembly of enwrapments disposed in a chain or series.

It is an object of the present invention to provide a plurality of enwrapments connected into a chain or series to facilitate the supporting, advancing, opening, filling, closing, sealing or other handling of the enwrapments during their use for packaging. One of the objections to packaging in bags under present commercial practices is the required manual handling of the individual bags or enwrapments. By the use of the present invention the amount of manual handling may be minimized. This results in substantial savings in the time and expense required for packaging and at the same time permits packaging with a greatly decreased possibility of contamination which is highly desirable in packaging foods, drugs, and many other products.

Another object is to provide a plurality of enwrapments such as bags secured together into a chain or series without chaining means, fastening means, or the like, other than such means as may be afforded on enwrapments manufactured in accordance with present conventional designs.

A further object is to provide a chain or series of enwrapments in which a portion of the closure means provided for such bags may be utilized to detachably chain the bags.

Another object is to provide a chain or series of enwrapments which is particularly adaptable to be used for packaging in connection with a continuously operated filling mechanism. In many instances which arise in packaging, close tolerances in the amount of material being packaged are not essential and the savings arising out of being able to fill the packages quickly will more than offset any slight overages in the amount of the contents placed in individual packages.

Other objects and advantages will become apparent from the following detailed description accompanied by the drawings in which:

Figure 1 is a perspective view of an envelope suitable for use in the fabrication of a chain or series of enwrapments embodying the present invention;

Fig. 2 is a perspective view of a portion of a chain or series formed from envelopes such as that shown in Figure 1;

Fig. 3 is a perspective view of a portion of a chain or series fabricated from a different enwrapment;

Fig. 4 is another perspective view of a fragment of a modified form of chain or series of enwrapments;

Fig. 5 is a fragmentary perspective view of an enwrapment of the type shown in the chain illustrated in Fig. 4 to illustrate the closure of such an enwrapment; and

Fig. 6 is another perspective view of another modified form of a chain or series of enwrapments.

Figure 1 illustrates a conventional form of mailing envelope or sack suitable for use in the present invention. Such envelopes are generally die cut and comprise a sidewall or main body 1 having tabs or wings extending therefrom. These tabs or wings may be folded onto the main body portion 1 to form an opposed sidewall 2, a bottom seal 3 and a top flap or closure member 4. If desired the top flap may be coated with a suitable adhesive material as is indicated by the numeral 5 so that

when the flap is folded over the mouth of the envelope, the adhesive may be used to adhere the flap and seal the envelope.

To fabricate a chain or series in accordance with the present invention the top flap 4 may be folded downwardly upon the sidewall of another envelope or enwrapment. A succession or series of envelopes thus secured together is illustrated in Fig. 2. The connection between adjacent enwrapments in the series may be accomplished in any desired manner, such as by staples, metal fasteners, adhesives, connecting elements, etc.

It is believed preferable that the connection be detachable and one advantageous way of providing a detachable connection is by the use of a thermoplastic adhesive material. For example, the adhesive 5 on the top flap 4 of the envelope may be a suitable thermoplastic adhesive placed on the top flap for use in sealing the mouth end of the envelope to prevent escape of the contents. To secure adjacent enwrapments in the chain or series together it is only necessary to activate, in any suitable manner, a portion of the adhesive area 5 on the flap 4 to cause the flap to adhere to a sidewall of an adjacent enwrapment in the series. The numeral 6 in Fig. 2 indicates the area of the adhesive which has been activated to obtain adherence between adjacent enwrapments. When it is desired to remove an enwrapment from the chain or series it is only necessary to reactivate the adhesive by heating the area 6 and the flap 4 may be readily peeled or slipped from the adjacent enwrapment. Then, to seal the envelope the flap 4 may be folded over the mouth and the entire adhesive area 5 heated to activation temperature.

Where a flat bag or envelope is utilized in fabricating a chain embodying the present invention, it is desirable that the area of adherence 6 between adjacent enwrapments be centrally located and not extend to the side edges of the enwrapments. Then, as may be seen in Fig. 2, the mouths of the enwrapments may be readily opened by pulling preceding enwrapments in the chain to permit entry of a filling spout or placement of the contents within the enwrapment.

Such a chain may be utilized for packaging by advancing it while supported in any suitable way beneath a filling mechanism which will place the material or commodity to be packaged into the open mouth of each enwrapment as it is advanced into registry with the filler. For example, the chained enwrapments may be supported by suitable side guides on a moving conveyor, or conveyor flight members may be interposed between adjacent enwrapments to support them along the fold line of the top flap 4. The interposition of flight members may be advantageous in connection with other operations. Heater elements may be incorporated in such members and by causing them to be heated at the desired time, separation of the enwrapments from the chain or series may be readily accomplished. It is contemplated that many other mechanisms may be used to advantage in supporting the chained enwrapments during their advancement.

Fig. 3 illustrates a chain or series of enwrapments fabricated from a different form of enwrapment. In this case the enwrapments comprise bags having opposed sidewalls 11 and infolds or gussets indicated by the numeral 12 at the edge walls connecting the opposed sidewalls 11. In these enwrapments or bags, one of the opposed sidewalls 11 extends beyond the other opposed sidewall in the region of the mouth of the bag to provide a flap or closing lip 13. The flap 13 may be provided with an adhesive area 14 similar to the adhesive area 5 of the envelope shown in Figs. 1 and 2. In the form of bag shown in Fig. 3, the sidewall 11 adjacent the mouth thereof may have an adhesive area 15 which will be in registry with the adhesive area 14 of the flap 13 when the

flap is folded over the mouth of the bag and superposed on the sidewall **11**. To fabricate the chain or series the flap **13** is folded downwardly and in this position the adhesive area **14** of the flap will be in registry with the adhesive area **15** on the sidewall **11** of the next adjacent bag in the chain.

These adhesive areas may be activated by heat and the adjacent bags adhere together to form the completed chain. Apparatus for assembling enwrapments into such a chain is shown and described in my copending application, Serial No. 56,941, filed October 28, 1948, now Patent No. 2,682,206, dated June 29, 1954, and entitled Apparatus For and Method of Chaining Enwrapments (see particularly Figs. 13 through 18).

The use of the adhesive areas **15** and **14** on the two surfaces to be adhered together is especially advantageous. When these areas are light coatings of a suitable thermoplastic adhesive they are not sufficiently tacky to adhere to surfaces other than a surface similarly coated with adhesive. Thus the presence of the adhesive does not cause undesired adherence but does provide secure adherence when the surfaces to be secured together are in engagement and pressed together.

Since the enwrapments in this form of the invention are provided with infolds or gussets, the connection between adjacent enwrapments may extend for the full width of the bags without detriment to the opening of the bag mouth. In fact, a connection along the full width of the bags is desirable since the resulting chain is adaptable for use with a continuously operated filling mechanism. The joinder of the bag walls of adjacent bags in the regions of the mouth, provides a relatively narrow separation between adjacent bag mouths so that as the enwrapments pass beneath a stream of the commodity or material being packaged, such material will fall into one or the other of the bag mouths. Where tolerance in the material being packaged is permissible, this provides an inexpensive and fast packaging operation since it is not necessary to individually measure the material to be placed in each of the enwrapments. The filling mechanism for advancing the chain or series of enwrapments may also be operated continuously and at a constant speed. The relationship between the speed of the enwrapment advancing mechanism and the speed of the filler will determine the amount of the commodity which will be disposed in each package.

After the enwrapments have been filled, the adhesive connection between adjacent enwrapments may be heated to activate the adhesive areas **14** and **15** and permit the separation of enwrapments from the chain so that the mouth of each enwrapment may be sealed.

Fig. 4 illustrates another chain or series of enwrapments. In this instance the enwrapments comprise lengths of seamless tubing **21** which may be provided with gussets or infolds along their side edges. An end portion of each of the lengths may be sealed in any suitable manner to provide a closed bottom for the enwrapment. Where the tubing is formed from a heat sealable material the bottom seal may be readily formed by autogenously welding the sidewall portions together. Such a seal is indicated by the numeral **22**. The tubular enwrapments may be connected together or chained by strips of sheet material **23** which may be folded along a line extending lengthwise of the strip so that the strip assumes an inverted U or V-shaped configuration. A surface of the strip **23** may be coated with a suitable adhesive material as indicated by the numeral **24** and the connection between the sidewall portions of adjacent enwrapments may be made by activating areas of the strip **23** to cause adherence between the strip and the enwrapments. The strips **23** are preferably of such a length that they extend beyond the sidewalls of the tubular enwrapments.

After the enwrapments have been filled they may be separated from the chain with one of the strips **23** still

secured to a sidewall of each one of the enwrapments. To seal the enwrapment the strip **23** may be folded over the mouth of the enwrapment and the adhesive coating thereon activated so that the two sides of the strip will adhere to the mouth portions of the enwrapment. The portions of the strip **23** extending beyond the enwrapment will adhere to themselves to provide a seal completely around the top and sides of the mouth of the enwrapment. If, due to the contents of the package, it is desired to provide an especially tight or siftproof closure, the sidewalls of the enwrapment at the mouth, if heat sealable, may be autogenously welded.

In Fig. 4 the strips **23** are shown as provided with a weakened portion or tear line along their longitudinal fold indicated by the numeral **25** in Fig. 4. This has been provided to obviate the necessity of activating the strips **23** to separate enwrapments from the chain and also to avoid the folding over of the strips **23** for sealing the mouths of the enwrapments.

The enwrapments may be removed from the chain by severing the strips **23** along the line **25** so that half of each of the strips **23** remains adhered to each of the enwrapments. Sealing of the enwrapments may be readily accomplished by pressing the severed halves of the strips **23** together and heating them to activate the adhesive **24** thereon so that the halves will completely adhere together. As clearly shown in Fig. 5 this provides a seal completely around the sides and top of the mouth of the enwrapment. Further if the enwrapment walls are heat-sealable or have been coated on the interior of the mouth with a heat-sealable substance the walls at the mouth may be autogenously welded for additional tightness of the seal.

When the strips **23** are retained on the completed package and utilized to facilitate sealing the enwrapment, the exterior portions thereof may bear advertising material, or be used as a label to state the contents of the package, or provide instructions regarding its use, etc.

An exceedingly desirable closure for many purposes may be made by sealing together the folded over portions or severed halves of the strips **23** without sealing together the walls of the enwrapment at the mouth. Such a closure is readily openable by tearing or cutting the strips **23** along the edge of the enwrapment mouth which facilitates access to the contents.

A further alternative closure may be provided by heating the connection between the strips **23** and one of the enwrapments which it connects and folding the strip and the mouth of the enwrapment over so that the strip **23** seals the enwrapment mouth to a portion of a side wall of the enwrapment.

Fig. 6 shows a further modified form of chain. In this form the enwrapments comprise lengths of tubing **31** provided with gusssets or infolds **32** along the edges between the side walls of the tubing. Suitable bottom seal portions **33** are provided by crimp sealing or autogenously welding the bottom edges of the tubing.

Both of the sidewalls of the enwrapment adjacent the mouth end thereof are provided with strips of a suitable adhesive coating indicated by the numeral **34** so that the side walls of adjacent enwrapments may be adhered together to form a chain or series. These adhesive areas may be a coating of an adhesive of the self-stick type or as previously described in connection with Fig. 4 may be a relatively light coating of a suitable thermoplastic adhesive which even though activated does not adhere except to a surface coated with a similar or compatible adhesive. Such strips or adhesive areas may be applied to the tubing in any suitable manner. In the case of seamless tubing the adhesive may be applied while the tubing is inflated, utilizing applicator rolls. Where the tubing is formed from a flat web, the application of the adhesive areas is similar to present methods of applying adhesive areas in conventional bag manufacture. It is contemplated that some adhesives may be applied as liquids under pressure by ejecting the adhesive from a

nozzle or the like to apply it at the desired area or areas.

The chaining for the form of chains shown in Fig. 6 may be readily accomplished by placing a plurality of the enwrapments in a stack or bundle and block sealing the sidewalls of adjacent bags together. If the material from which the tubing is made is a heat-sealable material, the chaining can be readily accomplished by utilizing an adhesive which does not require heat for activation or, if a thermoplastic adhesive is used it should have an activation temperature appreciably lower than the welding temperature of the film. In this way chaining can be accomplished without sealing together the bag walls.

As another alternative the forms of chains shown in Figs. 3, 4, 5 and 6 may be made so that the enwrapments are provided with reinforcing strips or tabs secured to the wall portions of the gussets or infolds in the region of the mouth of the enwrapment. These strips or tabs may be secured to the gusset walls in any suitable manner and if coated on their exterior surface with a thermoplastic adhesive, sealing of the enwrapment mouth will adhere the wall portions of the gussets together which provides an excellent closure and siftproof seal. Also, the tabs or strips serve to reinforce the gusset walls and may be desired to provide an excellent pouring spout when packaging flowable material. These features are more fully described in my copending application filed January 14, 1949, Serial No. 70,911, entitled, Bags and Methods of Making the Same, now Patent No. 2,653,751, dated September 29, 1953.

As shown and described, it is contemplated that the present invention may be utilized in connection with a wide variety of enwrapment designs and materials. Envelopes, sacks, pouches, gusseted bags, tubing (both gusseted and plain) may all be chained to form a series of enwrapments adapted to facilitate and simplify packing operations. Further, the enwrapments may be fabricated from a wide variety of sheet materials including the various forms of paper now in wide use, such as kraft, glassine, waxed paper, cellophane, cellulose derivatives, etc. These materials may be partially or completely coated with substances to improve the properties for packaging or heat sealing purposes, such as, for example, wax, Vinylite, polyethylene, latex, etc. Of particular interest are enwrapments formed from films of the many new plastic compositions such as, polyethylene, the vinyl resins, polyvinylidene chloride, rubber hydrochloride and the like.

It will also be obvious that a large number of adhesives are available for obtaining a secure connection between adjacent enwrapments. Thermoplastic adhesive substances have been described and give excellent results. However, in certain applications other materials may be preferred to provide the desired results. Some of the enwrapment materials may require other substances or a combination of adhesives in order to obtain adequate adherence or a detachable connection or other special characteristics where these be desired.

It will be obvious that many other variations and modifications from those shown and described for purposes of explanation and illustration may be made without departing from the spirit of the present invention.

What I claim is:

1. As an article of manufacture, a plurality of tubular enwrapments each having a side wall thereof extending beyond its opposite side wall in the region of the mouth of the enwrapment to form a flap, each of said flaps being reversely folded upon the side wall from which it extends, and each of said flaps being directly and detachably connected to a side wall portion of an adjacent enwrapment.

2. As an article of manufacture, a plurality of tubular enwrapments each having a side wall thereof extending beyond its opposite side wall in the region of the mouth of the enwrapment to form a flap, each of said flaps being reversely folded upon the side wall from which it extends, and said flaps having a coating of a thermoplastic adhesive thereon to create adherence between said flap and a side wall portion of an adjacent enwrapment.

3. A plurality of gusseted bags, each of which has one side wall thereof of greater extent than the opposed side wall thereof to form a flap, an adhesive area extending transversely of each of said flaps, a second adhesive area extending transversely along the exterior of the opposed side wall of each of said bags, each of said flaps being reversely folded upon itself along a line extending along the bag mouth, said bags being disposed in a bundle with their side wall in registry with the side walls of adjacent bags, and said flaps being adhered to the side walls of adjacent bags in said bundle along their respective adhesive areas.

4. In combination, a plurality of bags each having sides, closed bottoms and open tops and being of substantially equal height and width, said bags being disposed in registry with their bottoms in general horizontal alignment, and having also their open tops in general horizontal alignment, closure means on one side of each bag reversely folded to present an attaching surface adapted to lie against the adjacent side of an adjacent bag, and detachable adhesive bonds connecting the attaching surfaces to the adjacent sides of adjacent bags to secure said bags in contiguous relationship, said bonds serving to facilitate the supporting and opening of the bags during filling.

5. A device according to claim 4 wherein the closure means comprises an inverted V-shaped strip of material extending transversely of the axis of the bags and lying between adjacent bags of the upper portions thereof, and the detachable adhesive bonds are provided by adhesive material between the opposed faces of the walls of adjacent bags and the inverted V-shaped strip of material extending therebetween.

6. In combination, a plurality of bags having parallel side walls connected by gusseted ends, closed bottoms and open tops and being of substantially equal height and width, said bags being disposed in registry with their bottoms in general horizontal alignment, and having also their open tops in general horizontal alignment, and detachable adhesive bonds connecting the parallel side walls of adjacent bags to secure said bags in contiguous relationship, said bonds comprising narrow bands of adhesive extending transversely across substantially the entire opposed faces of the side walls of adjacent bags at the open tops thereof to secure said bags in the aforesaid relationship with the upper edges of adjacent bags connected throughout substantially their entire width, said bags being openable by tension exerted substantially perpendicular to said connected side walls to provide a plurality of substantially quadrangular filling openings in side-by-side relation and in continuous sequence and free from gaps between the adjacent edges of said openings.

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