

April 16, 1963

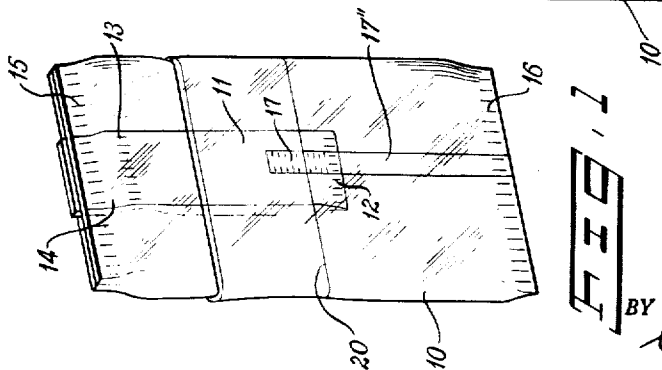
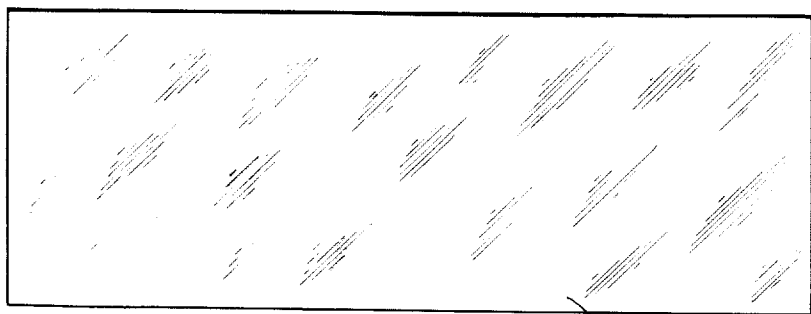
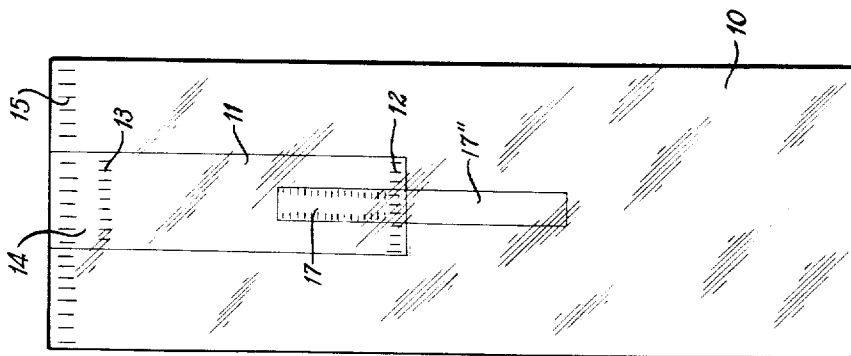
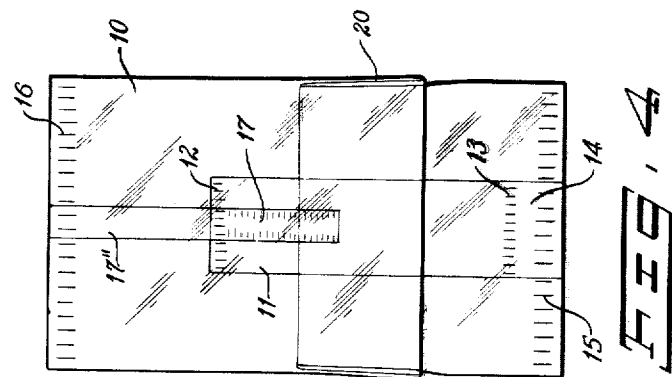
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3,085,681

COMPOUNDING AND PACKAGING UNIT

Filed July 16, 1959

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

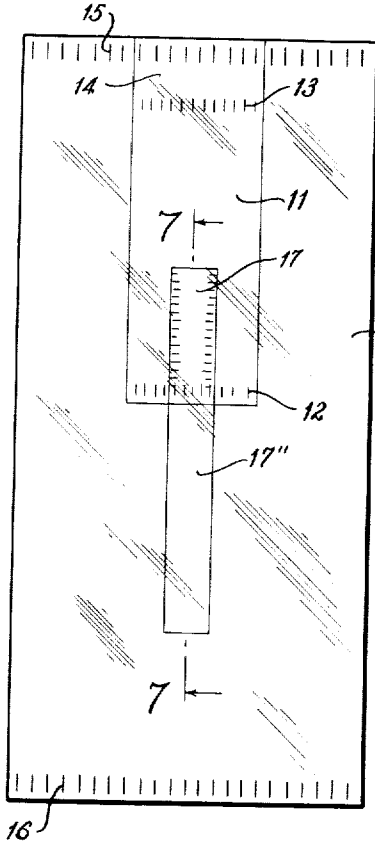


FIG. 5

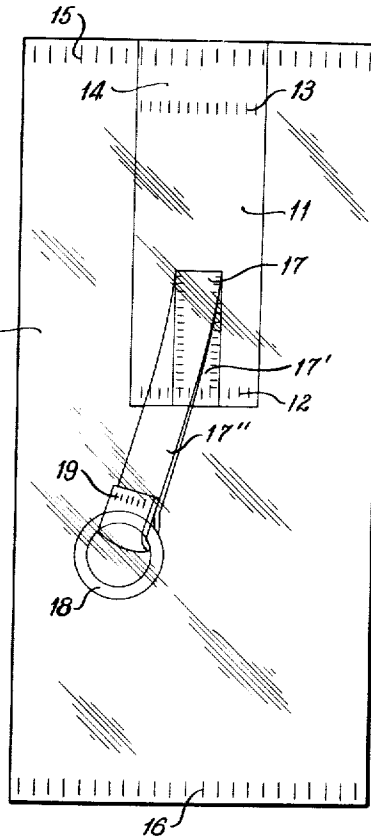


FIG. 6

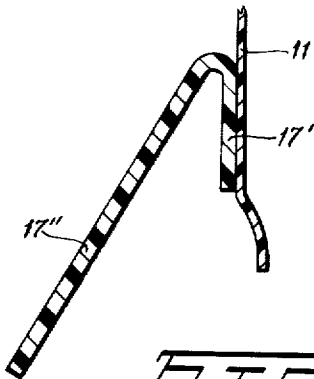


FIG. 7

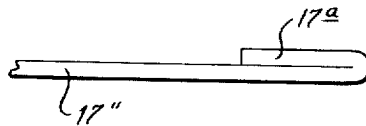


FIG. 8

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3,085,681
COMPOUNDING AND PACKAGING UNIT
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6 Claims. (Cl. 206—47)

This invention relates to a unit for so packaging the several ingredients or components of an ultimate compound or mixture that they are maintained in independent and complete isolation one from the other until it is desired to release them for intermingling and blending.

Accordingly the release of the several ingredients or components for intermingling to produce the ultimate compound or mixture while still confined in or contained within the packaging and compounding unit is proposed and contemplated by this invention.

By packaging the several ingredients or components of the ultimate compound or mixture in independent isolation in one unit the required quantity of each ingredient may be accurately measured so that their release will make possible their blending in the proper proportions to produce the desired ultimate compound.

With the above and other objects in view, as will be apparent, the invention consists in the construction, combination and arrangement of parts all as hereinafter more fully described, claimed and illustrated in the accompanying drawings wherein:

FIG. 1 is a perspective view of one type of packaging and compounding unit constructed in accordance with the present invention;

FIG. 2 is an elevation of the external or overall envelope of such unit and illustrates it prior to any fabrication and the placing of any of the ingredients or components of the ultimate or final compound therein;

FIG. 3 is a similar view showing an inner envelope filled with an ingredient or component of the final compound fixedly disposed in and anchored to one sealed end of said outer envelope or container, the opposite end of which remains unsealed and therefore open;

FIG. 4 is likewise an elevation of the present packaging and compounding unit with its position reversed with reference to that shown in FIG. 3 and with its outer envelope telescoped and its open end closed and sealed after receiving a second ingredient of the ultimate compound or mixture;

FIG. 5 is an elevation of another type of packaging or compounding unit made in accordance with this invention;

FIG. 6 is a like elevation of still another embodiment of a packaging and compounding unit following the teachings hereof;

FIG. 7 is a section through the wall of one of the envelopes or containers of the unit, being taken as along line 7—7 of FIG. 5 to illustrate the mounting or attachment of the tear tab by which the envelope may be opened to release its contents; and

FIG. 8 is an edge elevation of part of the tear tab to illustrate a modification thereof to facilitate the engagement thereof.

The instant unit is primarily concerned with the independent and isolated packaging of the several ingredients intended to be compounded or mixed within the unit and the release of such ingredients for their mixing or compounding within the unit to produce the desired compound. Hence the present disclosure is not limited to any particular compound or ingredients but is of general use and adaptation. Since this unit is especially useful in the packaging and compounding of synthetic resins it will be described in conjunction therewith. To that end, epoxy resin and its curing agent or activator will be used

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as an example, it being understood that the packaging and compounding of other resins and/or materials may be carried out in the subject unit without change or variation save perhaps in size and capacity.

To carry out this invention several envelopes or containers are employed; one as an outer or overall envelope or container to receive the epoxy resin, and one or more as subsidiary envelopes or containers, each to contain a reagent or ingredient to be ultimately released into the outer envelope or container for blending or mixing with the epoxy resin therein. Though several materials, satisfactory for the fabrication of all of these envelopes or containers, are available, it has been found that polyethylene is especially well suited for that purpose. It is transparent, clear, strong, thin and is incompatible to the ingredients to be compounded within the unit.

The packaging and compounding unit consists of the outer or overall envelope or container 10 and at least one subsidiary inner envelope or container 11. Since one secondary envelope or container 11 is provided for each ingredient to be compounded or mixed with the contents of the outer envelope 10 the number of such ingredients determines the number of secondary envelopes or containers that are fixedly secured within the outer envelope, as will be described.

Any suitable method may be employed for the fabrication of the several envelopes from polyethylene or other suitable material and by way of example and not by limitation the envelopes or containers are herein illustrated and described as being fabricated of one-piece cylindrical of polyethylene or other selected and suitable material. The length and diameter of each such cylinder is determined by its specific function and capacity. As, in the example, under discussion, the quantity of epoxy resin exceeds the quantity of the hardener or activator required, the outer or overall envelope or container 10 which is to receive the basic resin as well as a subsidiary envelope or container 11 of activator or hardener, is larger both dimensionally and in capacity than said subsidiary envelope or container 11. The number and relative proportions of the envelopes or containers 10 and 11 may be varied according to the number and individual quantities of the ingredients of the compound to be eventually blended or mixed within the envelope 10, without departing from the spirit and scope of this invention.

Referring to the drawings it will be observed that the subsidiary envelope 11 comprises a polyethylene cylinder that is shorter and of smaller diameter than the cylinder from which the outer or overall envelope 10 is made. One end of this cylinder 11 is fully heat sealed or cemented, as at 12, to close what, in the finished unit, is the inner end of envelope 11 against all leakage. Then the envelope or container 11 may be filled with a measured quantity of hardener or activator through its opposite open end and adjoining that end the cylinder 10 is heat sealed or cemented as at 13. Thus the inner or subsidiary envelope has both of its ends sealed against leakage and an anchoring tab 14 is created beyond the seal 13 at what is eventually the outer end of the subsidiary envelope 11.

The subsidiary envelope 11 is then placed within one end of the cylinder 10 with its anchoring tab 14 disposed in the extremity of such cylinder and the edges of said tab aligned with the adjacent end edge of the cylinder. Heat sealing or cementing as at 15, closes that end of the cylinder against leakage and fixedly secures the filled subsidiary envelope 11 in and to the end portions of the cylinder or envelope 10.

By reversing the position of the envelope 10 i.e., bringing its open end uppermost, it may receive and hold a measured quantity of epoxy resin. After the overall or outer envelope 10 is partially filled with epoxy resin

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through its remaining open end and that end is heat sealed or cemented, as at 16, thereby confining the epoxy resin and the subsidiary envelope 11 in the outer or overall envelope 10. It is advisable to only partially fill the outer envelope 10 to thereby allow ample space for the blending and mixing of the contents of envelope 10 with the contents of subsidiary envelope 11 when released into the outer or overall envelope 10 by manipulation of the unit.

In order to open the inner or subsidiary envelope 11 to allow its contents to escape into the overall or outer envelope 10 a tear tab 17 is heat sealed or cemented to and along the outer surface of one side of said envelope. This tear tab is a relatively long, narrow strip or tape of polyethylene having one end portion 17' resting flush against and sealed throughout its length to the material of the envelope 11. The opposite end portion 17'', which is unattached to the envelope 11, is then bent over the remainder of the tear tab 17 to project beyond the inner end of the subsidiary envelope 11. Any pull on the end portion 17'' of the tear tab 17 will cause that portion 17' of such tab sealed or cemented to the envelope 11 to tear the latter and allow its contents to escape into the envelope 10. To insure the successful operation of the tear tab 17 without breaking, it is made of polyethylene somewhat thicker than the polyethylene of which the envelopes 10 and 11 are fabricated.

Of course any required number of subsidiary envelopes 11 may be enclosed in and secured to the outer envelope 10, in which event each may be provided with its individual tear tab 17. Also a like tear tab can be provided on the outer or overall envelope 10 if desired. This is not illustrated for it would be identical with the tear tab 17 shown on the inner or secondary envelope 11 both in construction and operation. Indeed, as the outer envelope 10 of the unit usually is fully accessible, a tear tab is not necessary since it may be easily cut or otherwise opened when it is desired to release the compound blended or mixed therein. However when the subject compounding unit is enclosed or covered as in the impregnating kit disclosed in copending application Serial No. 810,468, filed May 1, 1959, a tear tab 17 on the outer envelope 10 would be advantageous if not essential.

In FIGS. 5 and 6 the outer or end portion 17'' of the tear tab 17 is free and may be grasped and manipulated through the wall of the outer envelope 10. The end portion 17'' of the tear tab 17 shown in FIG. 5 may be plain; or its extremity 17^a may be folded back for a short distance to rest flush against the body of end portion 17'' where it can be heat sealed or cemented to create a double thickness at the terminal of said free end portion all as shown in FIG. 8. This would facilitate grasping the tear tab 17 as above described.

In FIG. 6 the free extremity of end portion 17'' is looped through a ring 18 of any suitable material, preferably synthetic resin or like material. Thereafter such extremity is heat sealed or cemented to the portion 17'', above the ring 18 as at 19. Thus the ring 18 is permanently secured to the free end portion 17'' of the tear tab 17 and provides means to facilitate the engagement of the end portion 17'' through the wall of the outer or overall envelope 10.

In FIGS. 1 to 4 inc., the unit is so arranged that the tear tab 17 may be pulled to open the inner or subsidiary envelope 11 and release its contents without direct or indirect manual engagement of such tab. Taking advantage of the pliability and flexibility of the polyethylene of which the envelopes or containers are fabricated the outer or overall envelope 10 is shortened or telescoped by forming a lap or fold 20 around the wall thereof medially of its ends. This lap or fold 20 is disposed inwardly of the envelope 10 to closely underlie the wall thereof as shown in FIGS. 1 and 4. At that point in the assembly of the unit one end of the outer envelope 10 is open while its opposite end contains the secondary or subsidiary envelope 11 which is fixedly held in place by the engagement

of its anchoring tab 14 in the seal 15 that closes that end of envelope 10. The end portion 17'' of the tear tab 17 is only long enough to just reach the open end of the outer envelope 10 after the fold 20 is made and located. Thus, after the outer envelope 10 has received its quota of epoxy resin, the extremity of this relatively short tear tab end portion 17'' is engaged by and in the seal 16 which closes that end of the outer envelope 10.

It is apparent from the foregoing that the shortened or telescoped outer envelope 10 is so arranged that the length of the end portion 17'' of the tear tab 17 plus the length of the contained inner or secondary envelope 11 substantially equals the shortened or telescoped length of said outer envelope 10 and is appreciably less than the normal or expanded length of said outer envelope 10. Hence by grasping the ends 15 and 16 of the shortened outer envelope 10 and exerting a longitudinal pull thereon the outer envelope 10 is restored to its normal length and the tear tab 17 is consequently drawn to tear open the inner envelope 11.

What is claimed is:

1. A packaging and compounding unit comprising a pair of sealed envelopes fabricated of relatively thin, flexible material each containing a component of a mixture, one envelope being disposed within the other, a strip of material, constituting a tear tab, having one end portion fixedly secured to the outer face of the wall of the inner of said envelopes and its opposite end portion projecting beyond the end of said inner envelope, means for temporarily shortening the outer envelope and means for securing the extremity of the free end portion of the strip to the adjoining end of the shortened outer envelope.

2. A packaging and compounding unit comprising a relatively long outer envelope, a smaller and shorter inner envelope disposed in and anchored at one end to an end of the outer envelope, a strip of material fixedly attached at one end portion to the inner end of the inner envelope and having its free end extending toward the opposite end of the outer envelope, and a fold in the wall of the outer envelope disposed inwardly thereof and reducing the length of said outer envelope, whereby the extremity of said strip may be secured to the adjoining extremity of the outer envelope.

3. A packaging and compounding unit comprising a relatively long outer envelope, a smaller and shorter inner envelope disposed in and anchored at one end to an end of the outer envelope, a strip of material fixedly attached at one end portion to the inner end of the inner envelope and having its free end extending toward the opposite end of the outer envelope, and a fold in the wall of the outer envelope and reducing the length of said outer envelope, thereby disposing the extremity of said strip adjacent to the extremity of the outer envelope, and means for securing the extremity of the strip to the adjacent extremity of the outer envelope whereby a pull is exerted on the strip to tear the inner envelope upon restoring the outer envelope to its normal length by moving its ends in opposite directions.

4. A packaging and compounding unit comprising a relatively long outer envelope and a shorter, smaller inner envelope, said inner envelope being disposed in and anchored at one end to an end of the outer envelope, a fold formed in the wall of the outer envelope medially of its ends and disposed inwardly of and thereby telescoping such envelope, and a strip of material having one end portion fixedly secured to the wall of the inner envelope adjoining its inner end and its opposite end portion being just long enough to reach the opposite end of the outer envelope when telescoped where its extremity is permanently secured.

5. A packaging and compounding unit comprising two sealed envelopes each containing and isolating a component of a mixture, one whereof being the smaller is disposed in and anchored to one end of the larger outer envelope, a fold formed in the wall of the outer envelope

thereby shortening its length, and a tear tab secured at one end portion along the surface of the wall at one end of the inner envelope and having the extremity of its opposite end portion secured to that end of the shortened outer envelope opposite to the inner envelope with substantially all slack removed therefrom.

6. The method of assembly and packing a packaging and compounding unit comprising a relatively small inner envelope and a larger outer envelope consisting in sealing one end of a small tube of flexible material, so attaching a strip of flexible material to the outer surface of the smaller tube that one end portion thereof projects freely beyond the end of said tube, filling said tube through its open end, sealing such open end adjacent to the extremity of said tube thereby creating an anchoring tab, inserting the filled smaller tube in one end of a larger tube of the same material, having both of its ends open, with the anchoring tab of the smaller tube located in transverse alignment with the extremity of said larger tube, sealing that end of the larger outer tube to close the same and simultaneously secure the anchoring tab of the inner smaller tube to the end of the larger outer tube, reversing the outer tube and partially filling it through its remaining open end, forming a fold in the wall of the outer tube to shorten it and bring the extremity of the strip aforesaid in substantial transverse alignment with the open end of the outer tube, and finally sealing the open end of the

outer tube to close it and simultaneously secure the extremity of said strip thereto.

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