

Aug. 29, 1933.

C. P. WELLMAN

1,924,529

RECEPTACLE

Filed: April 25, 1930

3 Sheets-Sheet I

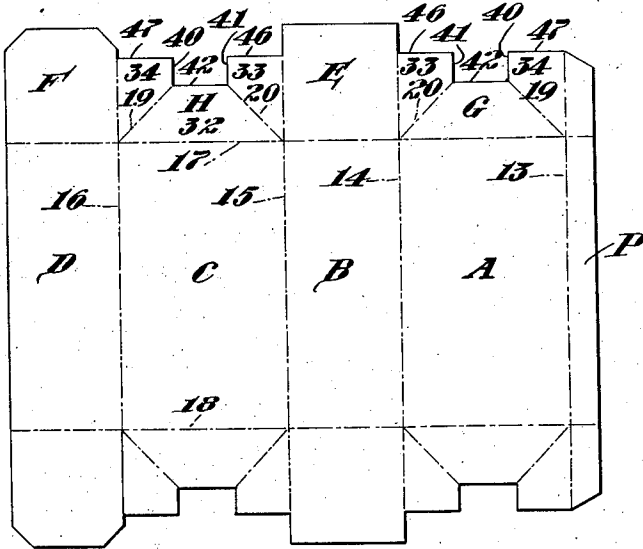


Fig. 1

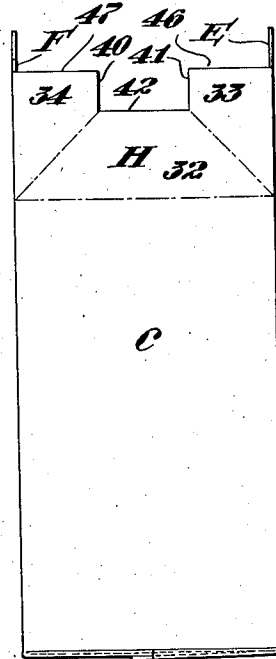


Fig. 2

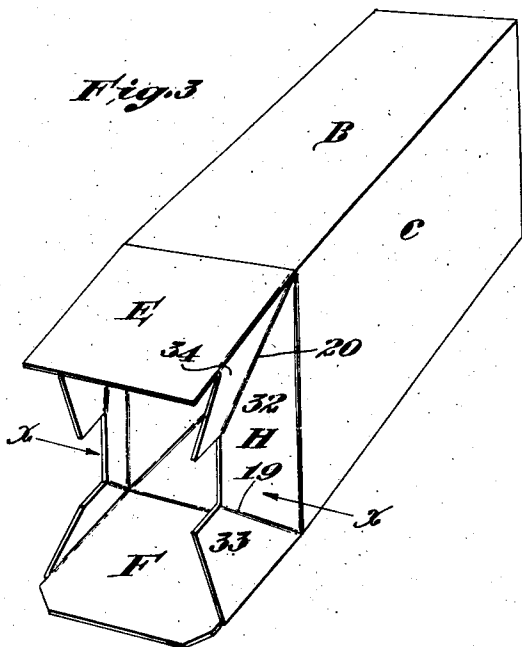


Fig. 3

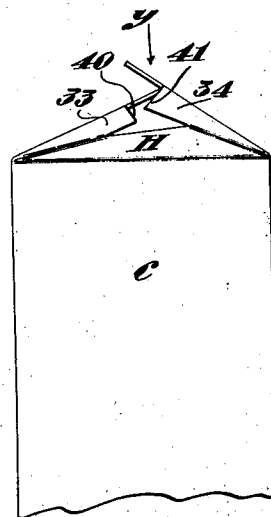


Fig. 4

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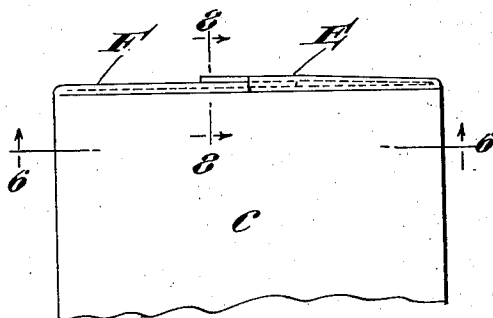


Fig. 5

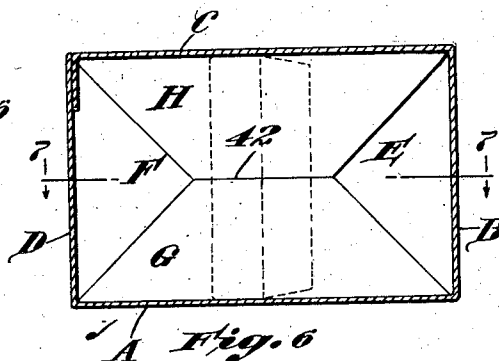


Fig. 6

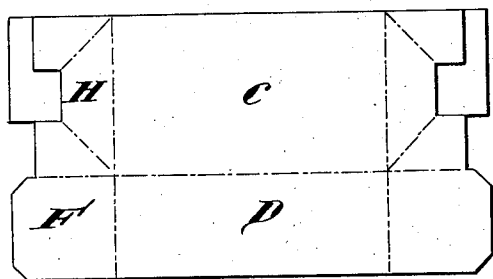


Fig. 9

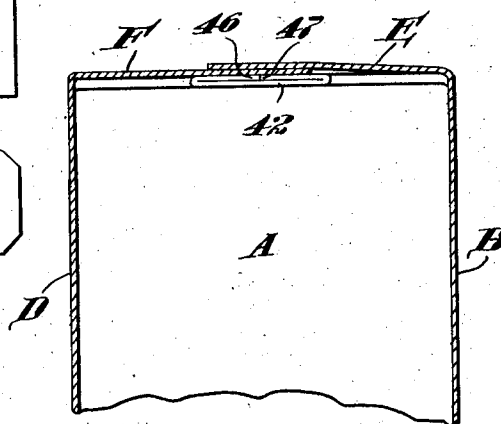


Fig. 7

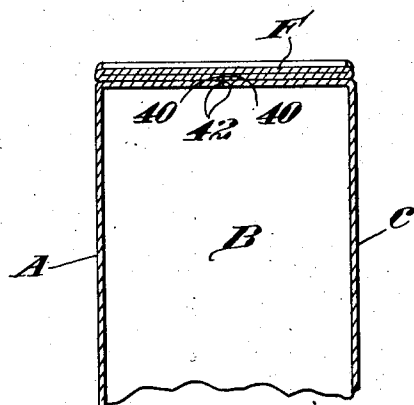


Fig. 8

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3 Sheets-Sheet 3

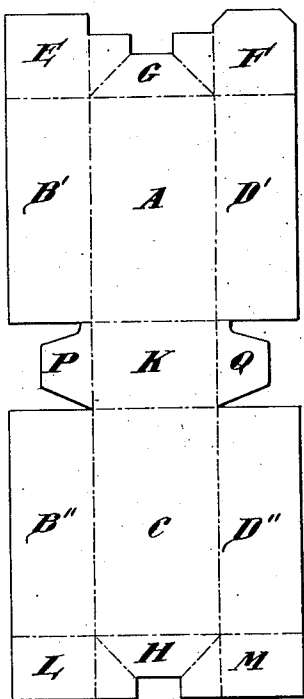


Fig. 10

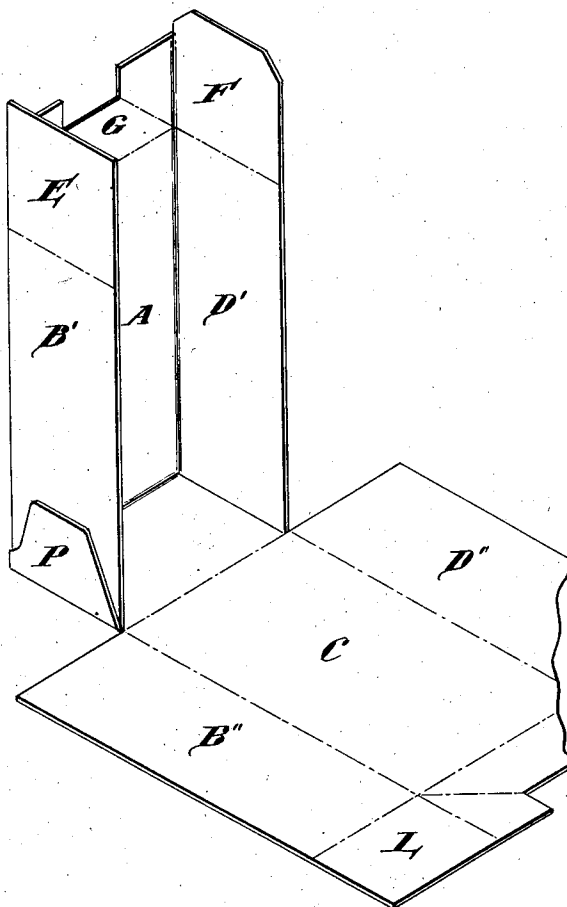


Fig. 11

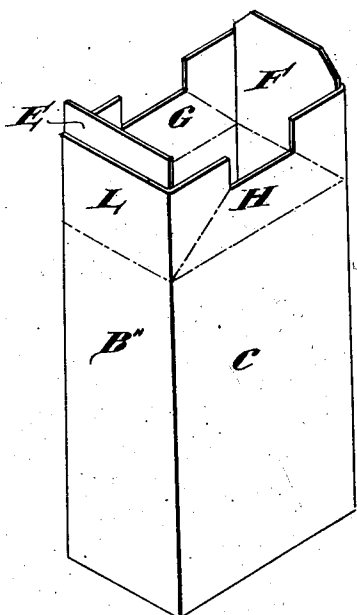


Fig. 12

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UNITED STATES PATENT OFFICE

1,924,529

RECEPTACLE

Charles P. Wellman, West Medford, Mass.

Application April 25, 1930. Serial No. 447,262

3 Claims. (Cl. 229—37)

This invention relates to receptacles made of any suitable foldable material, usually cardboard, paper or the like, to the method of making, and to blanks capable of being formed into, such receptacles. My invention is particularly applicable to receptacles for holding powdered substances, such for example as sugar.

Objects of my invention are to provide a receptacle adapted for folding, filling and sealing by automatic machines, which may be rapidly and easily folded from a flat blank, which has parts adapted to cooperate with closing and/or sealing instrumentalities to permit rapid and easy closing and/or sealing, which has parts which after closure cooperate to form joints having a minimum of length exposed to sifting of the contents, and wherein sifting or leakage of contents of the receptacle through the joints is prevented.

Additional objects of invention and features of advantage and novelty will be apparent from the following explanation of specific instances of the invention shown in the accompanying drawings by way of example only.

In the accompanying drawings:

Fig. 1 is a plan of a blank suitably creased for forming into a carton;

Fig. 2 is a side elevation of a form of an open-ended carton formed from the blank of Fig. 1;

Fig. 3 is a perspective view of the receptacle of Fig. 2, showing the manner of closing an end of the receptacle;

Fig. 4 is a side elevation of a receptacle showing the end more nearly closed than in Fig. 3;

Fig. 5 is a side elevation of the upper portion of a receptacle and illustrates the manner in which the receptacle is finally closed and/or sealed;

Fig. 6 is a section on the line 6—6 of Fig. 5;

Fig. 7 is a section on the line 7—7 of Fig. 6;

Fig. 8 is a section on the line 8—8 of Fig. 5;

Fig. 9 is a plan of a collapsed box made from the blank of Fig. 1.

Fig. 10 is a plan of another blank suitably creased for forming into a somewhat modified form of carton;

Fig. 11 is a perspective view diagrammatically illustrating the order of folding certain parts of the blank of Fig. 10; and

Fig. 12 is a perspective view of a box in the form of an open-ended carton made from the blank of Fig. 10 and ready for filling and closing.

The blank shown in Fig. 1 comprises a sheet of suitable material, such as cardboard, cut into

the form shown and provided with score or fold lines of increased flexibility 13, 14, 15 and 16 extending in one dimension and similar lines 17 and 18 extending in a transverse dimension to provide non-adjacent side wall sections A and C and non-adjacent intermediate wall sections B and D. The portion of the blank lying between fold line 17 and the adjacent edge of the blank is adapted to serve as one end closure of the receptacle formed from the blank while another portion lying between fold line 18 and its adjacent edge of the blank is adapted to serve as a closure for the other end of the receptacle. Since the two end closures may be identical, and are so constructed in the embodiment shown in Figs. 1 to 9, a description of only one is necessary. While it may be desirable to utilize identical closures, at opposite ends of the receptacle, as in this embodiment, my improved construction may advantageously be used at one end of a receptacle and the opposite end be constructed in any other desired fashion, for instance as shown in the embodiment of Figs. 10 to 12.

Referring to Fig. 2, in which the wall sections A, B, C and D have been angularly related, to form an open carton (the bottom being shown as closed), the illustrated end closure is adapted to extend in approximate prolongation of the side wall sections to form an upstanding extension of the receptacle. This extension may retain a portion of the contents of the receptacle during filling and while the contents are being compacted, as by shaking, to within the final volume of the receptacle.

In the embodiment of the invention shown in Figs. 1 to 9, the end closure includes primary end closure sections G and H, comprising extensions of side wall sections A and C, and secondary end closure sections E and F comprising extensions of intermediate wall sections B and D. The blank of Fig. 1 is provided with a connecting flap P extending along one side thereof and suitable to connect, for instance by means of glue, side wall A with intermediate wall D, and primary end closure section G with secondary end closure section F to form a collapsed tube such as shown in Fig. 9. This collapsed tube, which is in convenient form for storage or shipping, may be expanded into an open-ended carton, whereupon either or both ends may be closed by the end-closure sections provided. Fig. 2 shows such a carton having its top end-closure sections open. In the blank and receptacle primary end closure sections G and H are each of such height

(measuring from line 17 to the opposite free edge) that when folded into end-closing position, free edge portions of opposite members cooperate to form an inner closure. Diagonal fold lines of increased flexibility 19 and 20 are provided on each primary end closure section G and H in order to permit members E and F, which connect these members, to be folded into end-closing positions, these diagonal fold lines dividing each of members G and H into side portions 33 and 34 which lie respectively outside of these diagonal lines and a central portion 32 which lies between these lines. The sum of the heights of the central portions 32 is preferably substantially equal to the width of an intermediate wall section. When the various members comprising the end closure are folded into end-closing position, sections G and H are diagonally folded so that portions 32 form inner end-closing thicknesses and portions 33 and 34 form outer overlying thicknesses. In the closed position (see Figs. 6 and 8) the free edge 42 of each of these inner thicknesses is disposed close enough to the opposite inner thickness so that no more than a restricted passage (and preferably none at all) is left between these opposite inner thicknesses, and preferably the free edges 42 of these inner thicknesses cooperate to form a butt joint, as shown.

Portions 33 and 34, which are adapted in the closed position to form an overlying thickness, have free edges 40 and 41 respectively which, in the closed position, preferably overlie the free edge 42 of the corresponding inner thickness and form a joint with the respectively corresponding portions of the other diagonally folded primary end closure section. A preferred construction is shown in Fig. 8, wherein oppositely disposed free edges 40 of the outer thicknesses of the two diagonally folded primary end closure sections abut directly over the joint formed by free edges 42.

Portions 33 of the primary end closure sections have free edges 46, which in end-closing position lie in a common plane, transversely of the above described joints, and are adapted to form a joint, preferably a butt joint, with another portion of the receptacle. By thus providing inner and secondary overlying thicknesses provided with angularly related superposed joints, the sifting of the contents is minimized. In the illustrated embodiments of the invention outer portions 33 each have a length (measured from the fold line 17 to the free edge 46) of approximately one-half the width of the side walls A and C, so that the sum of the heights of these outer portions is substantially equal to the width of a side wall. Free edges 46 of portions 33, lying in a common plane, preferably form a butt joint with oppositely disposed free edges 47 of the similar portions 34, as shown in Fig. 7. To render possible this preferred construction wherein inner and outer thicknesses of the two sections G and H form a double thickness joint of appreciable length midway between opposite side walls A and C, and the opposite portions 33 and 34 of each of sections G and H form butt joints, the side wall sections A and C and primary end closure sections G and H should be wider than the intermediate wall sections B and D and the primary end closure sections E and F, as shown in Fig. 1.

Secondary end closure sections E and F disposed between and serving to connect the primary end closure sections G and H, form, in

end-closing position, an outer covering member overlying both thicknesses of sections G and H and serve to retain them in substantially parallel abutting relation. By providing a secondary end closure section of greater length than the adjacent primary end closure sections, for instance by having section E extend farther from fold line 17 than the free edges 46 of the adjacent sections, the joints formed between the free edges 41 of the opposite primary end closure sections, and the joints formed by free edges 46 with adjacent parts of the structure, may be effectively closed by an overlying thickness. Preferably, as shown, the secondary end closure sections E and F are each of greater length than half the width of the side walls A and C.

By tucking the outer extremity of member F under the outer extremity of member E, as shown in Figs. 4 and 5, the edges 46 and 47 may be brought into tightly abutting relation, and by suitably sealing members E and F together where they overlap, edges 46 and 47 may be retained in close contact. In sealing members E and F, a tension may be applied to them sufficiently to hold them flat against the folded primary end closure sections G and H, thus preventing the sifting of the contents therebetween.

The top of the receptacle thus comprises a cambered bellows, having throughout its major area at least three thicknesses composed of an inner thickness formed by the intermediate portions 32 of primary end closure sections G and H, a second thickness formed by the outer portions 33 and 34 of primary end closure sections G and H, and an outer overlying thickness formed by the second end closure sections E and F, and serving to seal the receptacle. Due to this cambered bellows folding the effective lengths of the joints exposed to sifting is materially decreased over former constructions, while the advantages of the closure requiring sealing at only one place, and the closure member serving as a continuous upstanding extension of the receptacle during filling are obtained. Furthermore the provision of the primary end closure sections directly connected to the side walls and to the secondary overlying end closure sections and folded to bring the free edge portions into close proximity, provides a high degree of strength and rigidity.

The hinged relation between the overlapped parts of the closure is useful in facilitating the closing of the receptacle, particularly when closed by machinery. Referring to Fig. 3, a compressive force applied to the receptacle along the line of the arrows x, and taking effect upon portions 32, serves to collapse the bellows top and bring the three thicknesses of the closure portion into almost parallel planes, as shown in Fig. 4. From this position the closing may be completed by a downward force applied to the top layer, as indicated by the arrow y in Figs. 4 and 5. By applying the compressive force indicated by arrows x to portions 33 at one side of their center, nearer to the tuck-in flap of member F, this flap will swing faster than member E, with the result that member E will overlie member F. By first applying glue to either E or F, near their extremities, and then closing the receptacle in the above-described manner, the downward pressure exerted, as shown in Figs. 4 and 5 will serve to seal the closure.

To enable the end-closing elements of the receptacle to be closed in the above-described

manner, and particularly by automatic machinery, it is highly desirable that both of the secondary end closure elements E and F be substantially higher than any parts of the primary end closure elements G and H, as shown in the drawings, so as to permit elements E and F to be overlapped without any interference by these primary end closure elements G and H. It is furthermore desirable that at least one of the two elements E and F (especially element F) be of materially less height than the width of the walls A and C which carry the diagonally foldable members G and H. By employing an element F thus proportioned this element may be tucked under the cooperating element E as described above and as shown in Fig. 4 without bending any substantial length of either element F or element E and without interference between them when they meet in closing the receptacle.

The embodiment of the invention shown in Figs. 10 to 12 is very similar to the embodiment of the invention shown in Figs. 1 to 9, and after assembling into an open-ended carton the end closure sections function correspondingly. In the description of this embodiment, corresponding reference characters are used to designate the various receptacle-forming elements.

The embodiment of the invention illustrated in Figs. 10 to 12 differs from that illustrated in Figs. 1 to 9 chiefly in that the bottom K of the receptacle is formed of a single section extending in prolongation of two side wall sections A and C of the box, and that two non-adjacent walls of double thickness are formed by overlapping intermediate wall sections B' and B'' and D' and D'' respectively. To side wall sections A and C are attached diagonally folding primary end closure sections G and H respectively, preferably identical in construction with those described in the embodiment of Figs. 1 to 9. Secondary end closure sections E and F are provided as in the previously described embodiment and serve the same purpose. At one end of the blank oppositely disposed connecting sections L and M of less length than the secondary end closure sections and preferably of the same length as the diagonally folding primary end closure section H are provided.

The blank of Fig. 10 may be folded into the open ended carton of Fig. 12, for example, by affixing the glue laps P and Q to adjacent walls in the order diagrammatically shown in Fig. 11,

and gluing members B'' and L to members B' and E respectively, and members D'' and M to members D' and F respectively. The open-ended carton of Fig. 12 may then be closed and/or sealed in the same manner as the open-ended carton of Fig. 2, the diagonally folded members G and H functioning in the same manner to provide a tight joint. The receptacle thus formed may then be closed in a manner similar to the previously described embodiment.

I claim:

1. A receptacle-forming blank consisting of an integral sheet of material marked by lines of increased flexibility into four main wall sections, two of said wall sections being wider than the other two, so as to form a receptacle of oblong cross-section, and pairs of end-closing elements comprising extensions of the pairs of wider and narrower wall sections respectively, the wider end-closing sections which comprise extensions of the wider main wall sections each having two diagonal fold lines of increased flexibility extending from the two corners which are adjacent to the conjoined main wall section, and the said wider end-closing sections being cut out from their outer edges to such an extent that in each of these wider end-closing sections a free edge portion of substantial length is included between the two diagonal fold lines of the section.

2. A receptacle having an end closure which includes extensions of two opposite walls of the receptacle folded across the end of the receptacle and each folded on two diagonal fold lines, a free edge portion of each of said diagonally folded extensions forming a butt joint with another free edge portion of the same diagonally folded extension, other free edge portions of substantial length of the two diagonally folded extensions lying closely adjacent along the middle of the end of the receptacle.

3. A receptacle having an end closure which includes extensions of two opposite walls of the receptacle folded across the end of the receptacle and each folded on two diagonal fold lines, a free edge portion of each of said diagonally folded extensions forming a butt joint with another free edge portion of the same diagonally folded extension, other free edge portions of substantial length of the two diagonally folded extensions lying across the end of the receptacle in parallel relation.

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