E. T. GREENFIELD.

BOTTLE.

APPLICATION FILED DEC. 14, 1908.

940,310. Patented Nov. 16, 1909.

Fig. 1.

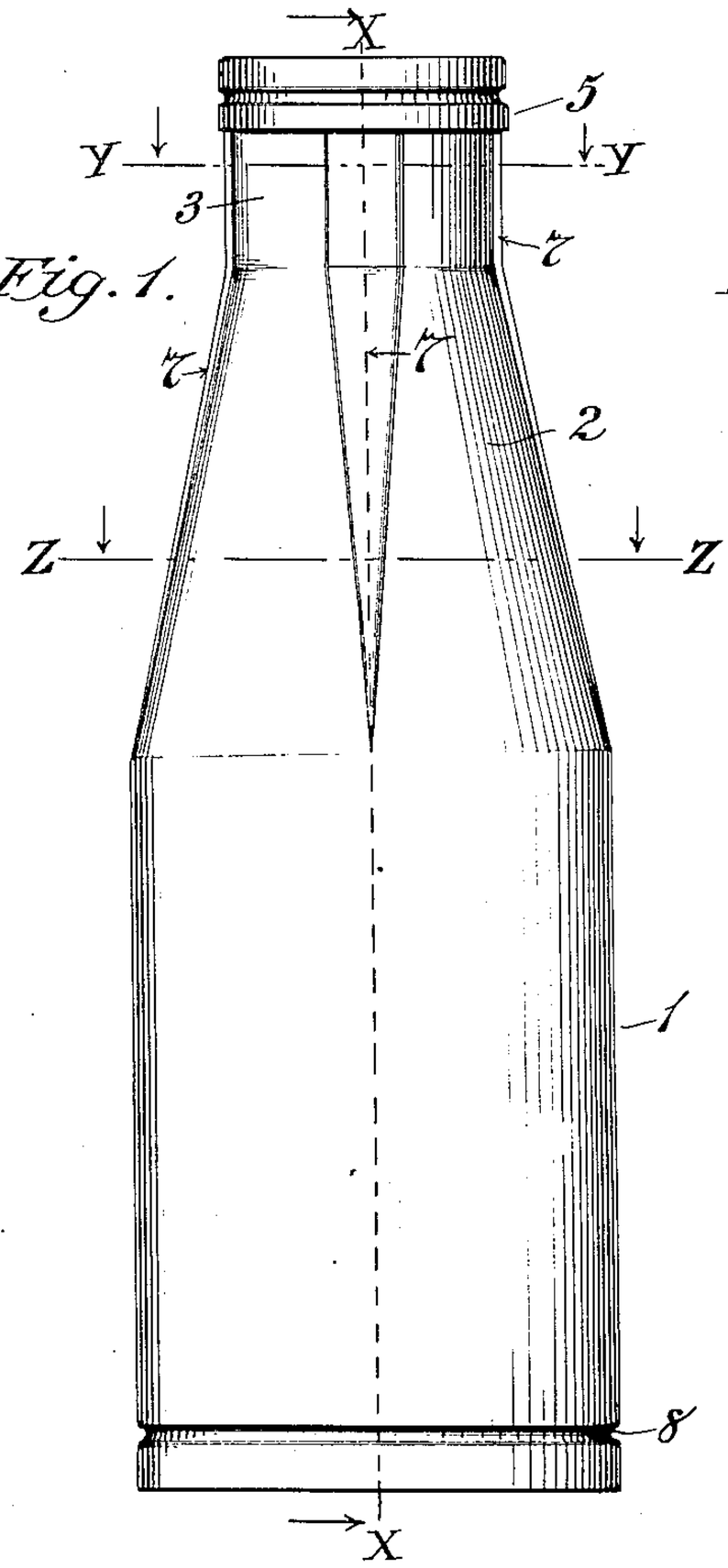


Fig. 2.

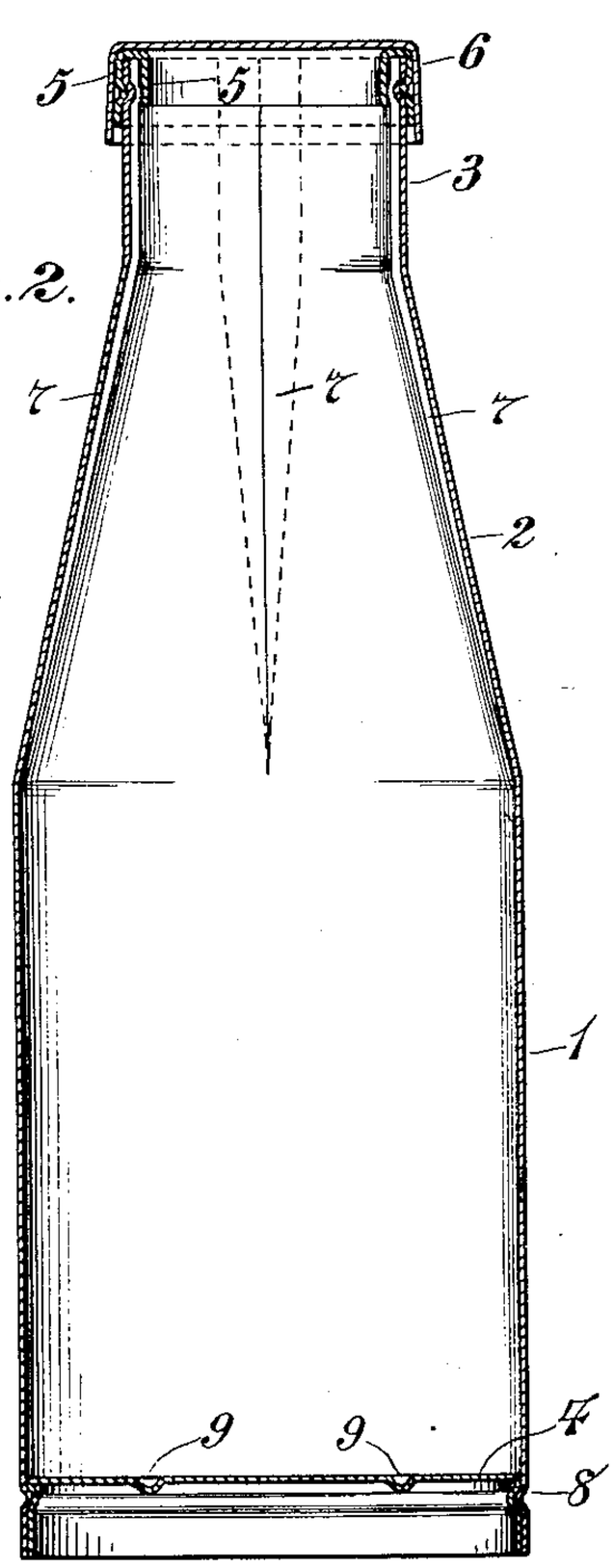


Fig. 3.

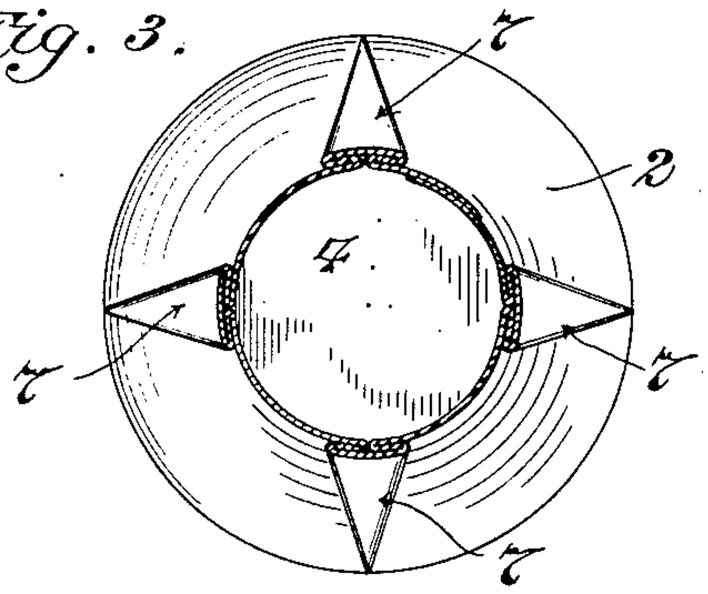
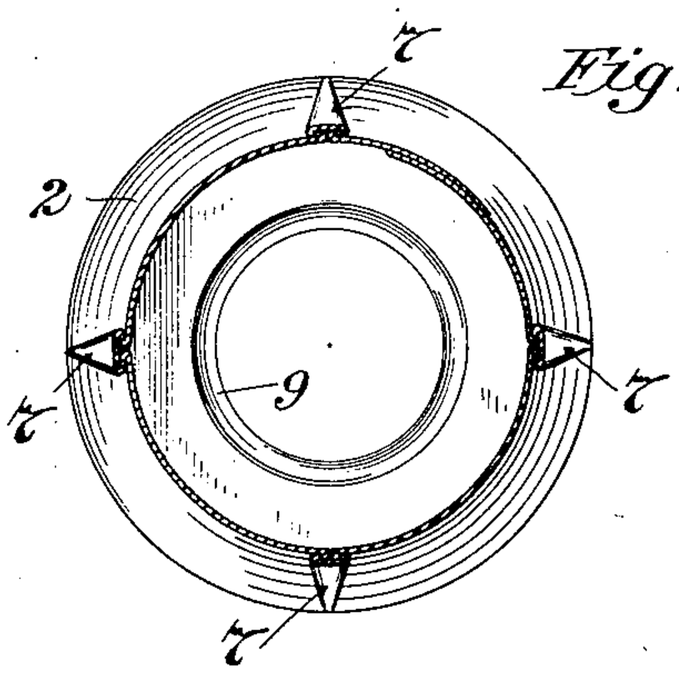


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWIN T. GREENFIELD, OF KIAMESHA, NEW YORK, ASSIGNOR TO GREENFIELD PAPER BOTTLE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

BOTTLE.

940,310. Specification of Letters Patent. Patented Nov. 16, 1909.

Application filed December 14, 1908. Serial No. 467,371.

To all whom it may concern:

Be it known that I, EDWIN T. GREENFIELD, a citizen of the United States, and resident of Kiamesha, county of Sullivan, and State of New York, have made a new and useful Invention in Bottles, of which the following is a specification.

My invention is directed particularly to bottles constructed of fibrous material, such, for instance, as paper, and it has for its objects, first, to device a bottle of this character which may be so cheaply constructed as to make it possible to use the same commercially a single time only and then destroy it, thereby providing a containing vessel which shall have the best possible sanitary qualifications. Second, to devise a bottle constructed of fibrous material, such as paper, which shall have the shape or conformation of well known forms of glass bottles having the usual body, throat and neck, and in which said throat and neck shall be relatively of much greater strength than the body proper of the bottle, thereby simulating, as far as possible, the structure of glass bottles by producing a bottle of relatively fragile material which will be capable of relatively rough usage without damage thereto, or without any possibility of releasing the contents thereof in bottling and handling the same. Third, to devise a bottle of the character indicated in which the bottom, throat and neck thereof shall possess relatively great strength and the entire structure such as to be of minimum weight. Fourth, to devise a bottle of the character indicated the parts of which, before being assembled, may be shipped directly to the user, occupying as small a space and being of as little weight as possible, said parts being structurally so devised that the complete bottle may be formed ready for filling at the point where it is to be filled, as in a dairy, farm-house, or analogous place where such perishable liquids as milk, cream, and the like are to be bottled and shipped to consumers. Fifth, to devise a bottle of the character indicated which, after it is once filled, can only be opened by the purchaser by destroying the lid or cover, or sealed portion thereof, when the liquid contained therein is to be used.

For a full and clear understanding of the invention, such as will enable others skilled in the art to make and use the same, reference is had to the accompanying drawings, in which,

Figure 1 represents an elevational view of a full sized bottle embodying all of the features of my invention. Fig. 2 is a vertical sectional view taken through Fig. 1 on the line X—X and as seen looking thereat from left to right in the direction of the arrows. Figs. 3 and 4 are transverse sectional views taken through Fig. 1 on the lines Y—Y and Z—Z respectively, and as seen looking thereat from the top toward the bottom of the drawings in the direction of the arrows.

Prior to my invention bottles or containing vessels have been constructed of fibrous material, such as paper, in which the entire structure is either of cylindrical form or cone-shaped, with bottoms and tops in the nature of compressed cups made of the same material and secured thereto in various ways. All such bottles or containing vessels, however, with which I am familiar, are either made of a single layer of material or of a plurality of layers having the same thickness throughout the length of the bottle. Such devices are open to the objection that they have not sufficient strength, at those parts of the structure by which they are handled, to prevent their being damaged in marketing or shipping. Such structural devices are also open to the further objection that their dissimilarity to existing types of containing vessels, in the nature of glass bottles for milk, cream, or dairy products generally, makes it impossible to expeditiously handle the same as ordinary bottles are handled, namely, by the throats and necks thereof. Such bottles are also open to the further objection that all parts of the same are of like thickness and there is a possibility of puncturing the bodies in ordinary manipulation during the handling thereof. My improved bottle overcomes all of these objections and to such an extent that it may be handled identically as glass bottles are handled and with much less danger of the vessel being ruptured or broken. At the same time, my novel bottle is materially lighter, thereby affording a vessel of the character indicated which makes it far preferable to existing glass bottles.

I produce a bottle of the character indicated by first forming one or more thick-

nesses of paper into a tube of the desired diameter to constitute the body of the bottle and secure the edges thereof together. I then so act upon one end of this tube, through the agency of pressure and heat, as to form a series of box-plaits, which plaits are of the greatest width throughout the length of the neck and the edges thereof are parallel with each other, said plaits converging gradually from the lower end of the neck to the lower end of the throat or to the upper end of the body of the bottle proper. Such box plaits constitute a means of not only effecting greater strength to the neck and throat part of the bottle, but also of radially taking care of the surplus material which necessarily results from forming one end of a tube into a converging throat and cylindrical neck. I then secure in any preferred manner a paper cup bottom to the lower end of the body part and a strengthening rim to the upper end of the neck, after which I provide a detachable cup shaped cap, such parts constituting the completed bottle.

Referring now to the drawings in all of which like numerals represent like parts wherever used, 1 represents the body of the bottle which is in the nature of a paper tube made preferably of strong manila or like material, the length of said tube before the bottle is formed being substantially the length of the completed bottle. 2 represents the throat thereof and 3 the neck, which throat and neck are preferably formed by subjecting the upper end of the tube as hereinbefore stated to relatively great pressure between the parts of heated external and internal molds and in such manner that when this pressure is being effected a plurality of strengthening ribs, preferably in the nature of box plaits 7, 7, are formed, the edges of which are parallel with each other throughout the entire length of the neck and converge toward each other from the lower end thereof to the bottom of the throat or the top of the body part proper of the bottle, as clearly illustrated in Figs. 1, 3 and 4. These plaits may be formed by any desired mechanism, as, for instance, by a heated interior metal mold having the conformation of the interior of the completed bottle and by ironing down the plaits by a heated iron, such a method of construction being possible and it being obvious that when the throat 2 and neck 3 are thus formed, said throat and neck will have an increased strength from the shoulder to the bottom of the neck and the neck itself will be of relatively greater strength, dependent upon the size and number of the plaits. I have shown in the drawing, four such plaits. In practice, I should prefer to make six, thus bringing the lateral parallel edges thereof relatively closer together around the neck where the greatest strength is required. It will be apparent, therefore, on inspection of the drawings, that the throat and neck necessarily are relatively much stronger than the body part 1 of the bottle and that the same may be handled as an ordinary glass bottle is handled, by the throat and neck, while in the course of filling, transporting, or use generally and without danger of injury thereto. After the body, throat and neck are thus formed a cup 4, made of paper or other fibrous material by compression in a heated die in a manner well understood by those versed in the art of making pressed paper articles, is inserted, bottom upward, in the bottom of the body 1, then said cup and bottom are subjected to the influence of a heated beading tool, so that the two parts are secured together by the joint action of two concentric beads 8, in the manner shown in Fig. 2. The cup 4 may be provided with one or more corrugations 9, as shown, for giving increased strength to the bottom. A mouth ring 5 is then constructed by heated dies, said ring having downwardly extending lips, as clearly shown in Fig. 2. This ring is slipped over the upper portion of the neck, as shown, and it and the neck are then subjected to the action of a heated beading instrument as was the bottom 4, so as to thereby effectually secure said mouth ring to the upper portion of the neck through the agency of concentric beads, similar to the concentric beads 8 at the bottom.

The entire bottle is then subjected to a bath of molten paraffin, thus making it not only effectually liquid tight, but rendering it also practically transparent so as to enable one to inspect the liquid contained therein. A cup-shaped cap 6 is then prepared in a heated die and the same is of such dimension and shape as to enable one to fit it over the mouth ring 5. After the bottle is filled, this cap which has also been paraffined is placed in a manipulating device or cup heated to sufficient temperature to fuse the paraffin and the cap is forced snugly over the mouth ring 5 and allowed to seat and seal itself against the latter. It will also be obvious that where box plaits are of such number and width as to bring the lateral or parallel edges of the same about the neck against each other, or in relatively close relation to each other, the bottle will present a symmetrical appearance to that of glass bottles having throats and necks, and that bottles as thus constructed will have increased strength against compression in handling from the top of the body part to the lower end of the neck, and still further strength throughout the entire length of the neck, thus resembling in this feature existing types of bottles of glass and like materials.

It will be obvious that the parts of such a bottle may be shipped to the point where it is desired to construct and use it, in the

nature of tubular body parts 1 flattened out, and the other parts embracing the bottom, mouth ring, and cap, similarly shipped and formed and put together in the manner described so as to constitute a complete perfect bottle which may be cheaply and quickly made.

I make no claim in the present application to the method of making such a bottle, as the present invention is directed purely to an article of manufacture adapted to be constructed in the manner hereinbefore described, the aforesaid method being claimed in a companion application filed in the U. S. Patent Office on the 14th day of December, 1908 and bearing Serial No. 467,372.

I do not limit my invention to the specific details of construction shown, as the essence of my invention lies in the formation of a bottle from one or more sheets of paper or analogous fibrous material, and of such a structural form that it resembles the well known type of glass bottles now in general use throughout the world, the most essential feature of my invention lying in the production of a bottle which possesses the qualifications hereinbefore enumerated.

It will be noted that by my improvement I have devised a bottle made of paper or other fibrous materials which simulates in all respects well known types of glass bottles, in that the throat gradually increases in strength from the top of the body part of the bottle to the lower end of the neck, while the latter is of greater strength in cross section than either the throat or the body, so that my improved bottle has practically all of the qualifications of strength as to those parts by which such bottles are ordinarily handled, as is found in well known types of marketable glass bottles, and my claims hereinafter are designed to be of such scope as to fully protect me in the application of this generic idea to bottles made of materials other than glass, porcelain, pottery ware, or the like.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is—

1. As an article of manufacture a paper bottle embracing a body part and a bottom therefor; a neck and throat provided with box plaits, the edges of the plaits of the neck being parallel throughout the length thereof and the like edges of the plaits of the throat converging from the lower end of the neck to the lower end of the throat, substantially as described.

2. As an article of manufacture a bottle constructed of paper or analogous material, the neck and throat being formed at one end of a tube and with box plaits, the outer edges of which are parallel throughout the length of the neck, while the outer edges of the plaits of the throat converge from the bottom of the neck to the top of the body part; together with a bottom secured at the lower end of said body part, substantially as described.

3. A paper bottle having a box plaited neck and throat; a tubular body; and a cup-shaped bottom secured to the lower end of the body, the edges of the box plaits being parallel throughout the length of the neck and converging from the lower end thereof throughout the length of the throat, substantially as described.

4. As an article of manufacture a bottle constructed of paper and embracing a tubular body part, a bottom, a throat, a neck, and a strengthening ring for the neck; the neck and throat being provided with box plaits, the outer edges of which are parallel throughout the length of the neck, while the like edges of the plaits for the throat converge from the bottom of the neck to the top of the body part, the bottom being secured to the lower end thereof by concentric beads and the strengthening ring similarly secured to the neck, substantially as described.

5. As an article of manufacture a bottle constructed of paper and embracing a tubular body part, a bottom, a throat, a neck, and a strengthening ring for the neck; the neck and throat being provided with box-plaits, the outer edges of which are parallel throughout the length of the neck, while the like edges of the plaits for the throat converge from the bottom of the neck to the top of the body part, the bottom being secured to the lower end thereof by concentric beads and the strengthening ring similarly secured to the neck; together with a cup shaped cap adapted to act as a cover for the bottle, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN T. GREENFIELD.

Witnesses:

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C. J. KINTNER.