

April 13, 1943.

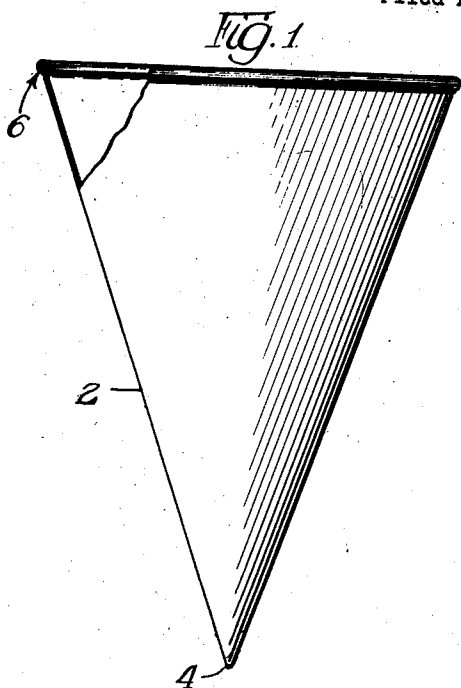
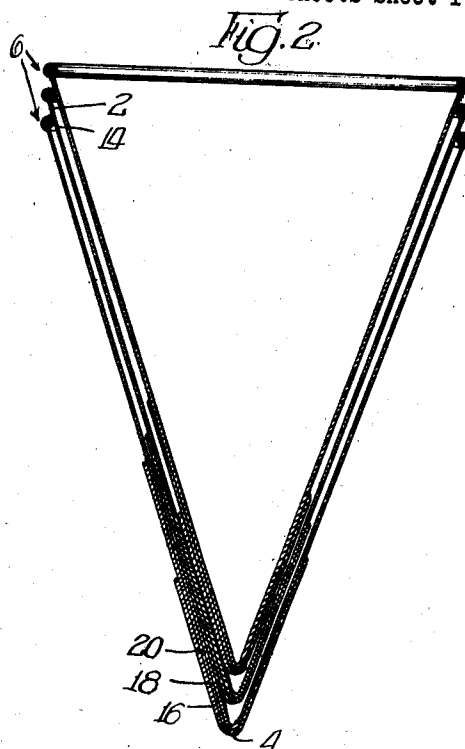
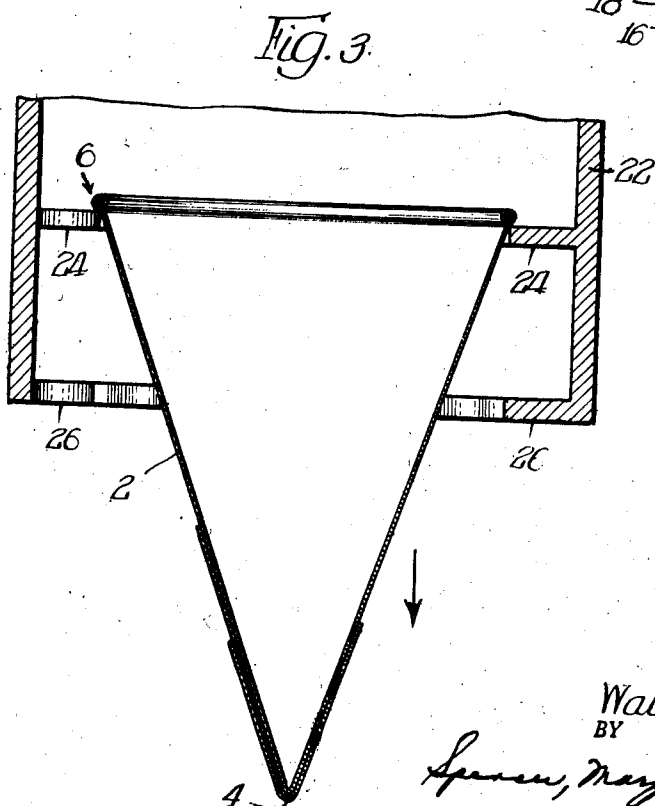
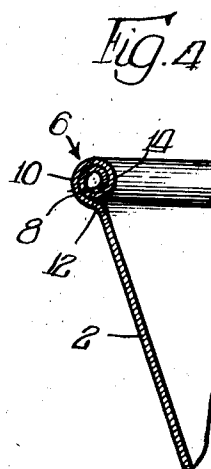
W. E. AMBERG

2,316,150

PAPER CUP

Filed April 2, 1942

2 Sheets-Sheet 1



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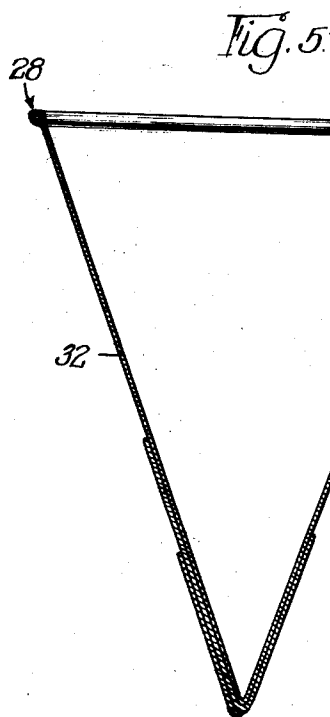
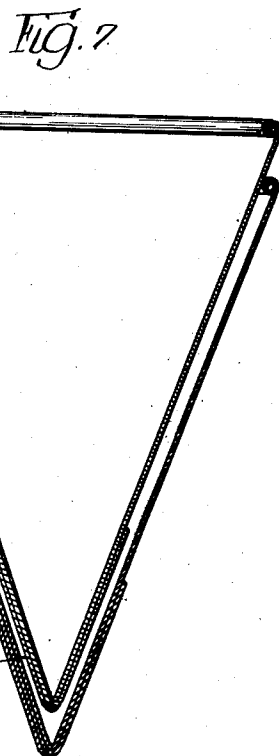
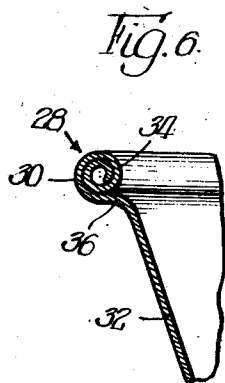
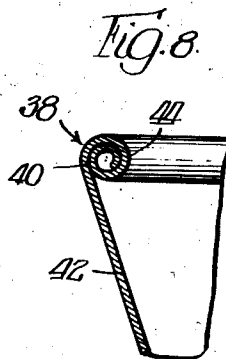
W. E. AMBERG

2,316,150

PAPER CUP

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,316,150

PAPER CUP

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Application April 2, 1942, Serial No. 437,381

4 Claims. (Cl. 229—1.5)

This invention relates to paper containers and has for an important object thereof the provision of new and improved types of paper containers having a new and improved type of rim around the mouth thereof, more particularly paper containers such as drinking cups, soda cups and other types of cups which are ordinarily sold in stacked or nested form.

As is well known, paper containers such as drinking cups which are stacked or nested one within the other are commonly placed in dispensers from which they are withdrawn by pulling the lowermost cup from the bottom or sides thereof through a dispensing opening. Such dispensers are generally characterized by the provision of one or more resistance members which permit the withdrawal of the lowermost cup but impede or prevent the removal of other cups from the stack at the same time.

It is also well known that many types of paper containers such as drinking cups have beaded or rolled rims. One of the primary purposes of such rims is to prevent the mouth of the user of the cup from being cut by the sharp edge of the paper. The rolled rims heretofore used on drinking cups and similar types of containers, however, have suffered from the disadvantage that they tend to unroll or otherwise be damaged or destroyed. This is largely due to the fact that these rims have always been beaded or rolled from the inside out. Since the cup when used and when dispensed is normally subjected to stress in the opposite direction, the general tendency is to cause the rim to be unrolled which renders the cup unfit for use in many instances. This problem has retarded the development of rolled rim or beaded cups in many cases, for example, where the dispensers used in a particular cup industry have all been designed for dispensing cups having no rim, as exemplified by the cone-shaped cups heretofore widely used. In these instances the manufacture of rimmed cups having the conventional type of rim would necessitate the replacement of thousands of dispensers before the cups could be dispensed properly and before the market could be developed by the manufacturer.

One of the objects of this invention is to solve the problem previously described and to provide a rimmed cup which can be used in conventional dispensers for similar cups having no rim.

Another object of the invention is to provide a new and improved type of paper container having a new and improved type of rim around the mouth thereof which does not tend to unroll,

become damaged or be destroyed by the conventional stresses to which cups of this type are normally subjected. Other objects of the invention will appear hereinafter.

In accordance with the practice of the present invention, a paper container of the type previously described is provided having a rim around the mouth thereof which, instead of being rolled or formed in the conventional manner, is rolled or formed from the outside in. In this type of construction the open mouth of the container or cup is rolled in such a way that the edge terminates on the inside of the cup instead of the outside, as in previous practice. The bead or rolled portion of the rim presents a continuous unbroken surface which adequately resists the stresses normally placed thereon during a dispensing operation or during the use of the cup. Such stresses when applied to the present type of cup not only fail to unroll the rim or otherwise destroy it, but actually have a tendency to cause it to be wound tighter.

Other features and advantages of the invention will become apparent from a reading of the following specification in the light of the accompanying drawings, in which:

Figure 1 is a side elevational view with parts broken away and partly in section of a cone-shaped paper cup provided with a rim in accordance with the practice of the present invention;

Figure 2 illustrates the manner in which cone-shaped paper cups provided in accordance with the invention are nested;

Figure 3 illustrates the manner in which a cone-shaped cup provided in accordance with the invention may be dispensed;

Figure 4 is a partial sectional view taken through the rim of a cone-shaped paper cup provided in accordance with the invention, illustrating one form of such rim;

Figure 5 is a side sectional view of a cone-shaped paper cup, illustrating a modification of the cup shown in Figures 1 to 4;

Figure 6 is an enlarged view of one portion of the cup shown in Figure 5, illustrating in more detail the configuration of the rim and its position with respect to the side wall of the cup;

Figure 7 is a view of a modified type of cup having the rim rolled entirely within the cup and of such construction that the rim itself serves to separate the cups from each other in nested relationship;

Figure 8 is an enlarged detailed partial sectional view, illustrating the rim structure of the cup shown in Figure 7.

Referring to Figures 1 to 4, inclusive, the type of cup illustrated therein is a cone-shaped cup having side wall 2 converging toward an apex 4. Many cups of this type are known in the art and no attempt is made herein to confine the present invention to any particular type of cup, because it will be apparent that the principles involved are generally applicable to all types of cone-shaped cups. Hence, in Figure 1 the cup shown is only conventionally illustrated as being of conical form, and it will be understood that the type of blank used in making the cup, the configuration of the apex, and other factors unrelated to the formation of the rim, are of no significance.

In the cup shown in Figure 1, the rim is generally indicated by the numeral 6. This cup is shown in more detail in Figure 4. In this particular type of cup which represents a preferred form of the invention, it will be observed that the upper edge 8, which would ordinarily form the mouth of the cup in the absence of the rim terminates within the rim of the cup, as well as inside the cup with respect to the outer rim portion 10. As will be observed, in the rolling of the rim the upper part of the side wall 2 is offset with respect to the remainder of the side wall at point 12. The rolling of the paper begins at this point and extends outwardly and upwardly, then inwardly again, in the manner shown in Figure 4, thereby forming a smooth continuous or unbroken outer rim portion 10, which extends beyond the side wall of the cup, and an inner rim portion 14, which extends inside of the cup with respect to a plane through the rim coinciding with the side wall.

This type of cup has the advantage that the inwardly projecting rim portion 14 does not change the normal "nesting depth" of the cup when stacked or nested. The term "nesting depth," as used herein, refers to the normal spacing of the cups from each other if the cups had no rims or beads formed on the mouth thereof. As shown in Figure 2, the nesting depth is determined, in most cone-shaped cups at least, by the amount of material, or the number of plies of paper at the apex. The cups illustrated in Figure 2 are the so-called convolutely wound cone-shaped cups in which a greater thickness of paper is placed at the apex and the winding spirals upwardly until there is only a single thickness of paper at the mouth of the cup, except for the seams where the paper is overlapped. Thus, in the type of cup shown in Figure 2, the nesting depth is determined by the three plies of paper 16, 18 and 20 reaching the outermost, the middle and the innermost ply, respectively. In the embodiment of the invention illustrated with respect to Figures 1 and 2, the rim tolerance is such that the inner rim portion 14 of one cup at the most barely touches the side wall 2 of the next cup which is nested therein. Thus, this particular type of rim does not change the nesting depth and permits the use of the cup generally in the manner in which cups of a conventional type, having no rim, have heretofore been used. This is of special value because it is thereby possible to dispense these cups from conventional dispensers.

As illustrated by Figure 3, a conventional dispenser 22, as exemplified by United States Re-issue Patent No. 17,664, is provided with superposed rows of teeth 24 and 26. For convenience, the upper part of the dispenser, which merely serves to hold the stack of cups against lateral movement and to keep out the dust or dirt, has

not been shown. When the dispenser is used, a stack or nest of cups is seated with the lowermost cup on the projection or resistance elements 24. Here again, only the lowermost cup has been shown, because the remainder of the stack is unnecessary for the present illustration. The lowermost cup is withdrawn by grasping it around the sides or near the apex thereof and pulling downwardly toward the dispensing projections 26 in the direction of the arrow. The next to the lowermost cup of the stack, not shown, then becomes seated on the projections 24. The second set of projections 26 is provided as a precautionary measure in case two cups should become stuck together and both of them should pass the first set of projections. In this case the second set of projections would serve to separate the cups and permit the dispensing of only the bottom cup. The projections or resistance members 24 and 26 are rigid and this type of dispenser necessarily depends to some extent upon the flexibility of the cup. Other types of dispensers are in use, but all of them depend upon resistance members in some form. It will be observed that with cups of the present invention, the stress of the resistance member is against the rim of the cup as the cup is being withdrawn, and in this type of dispenser the stress is applied on two separate occasions, first by the resistance elements of the ring-like member 24, and second by the resistance elements of the ring-like member 26. With the type of cup provided in accordance with the present invention, even though the stress applied may be considerable, there is no tendency to unroll the rim, as in the conventional type of rimmed cup, because due to the manner in which the rim is formed by rolling from the outside in, instead of from the inside out, the stress applied by the resistance members of the dispenser tends to tighten rather than loosen the rim.

In the type of cup shown in Figure 5, a different type of rim structure is used, although the general principle of rolling the rim from the outside in is still employed. In this type of cup, as shown in Figure 6, the rim generally indicated at 28 is rolled from the outside in, in the same manner previously explained, with the outside portion 30 farther removed from a plane drawn through the side wall 32 of the cup, and the inside portion 34 substantially coincides or touches a plane coinciding with the inside of the cup, thereby creating a somewhat greater offset at point 36. This type of cup has the general advantages of the cup previously described and may be used where a greater projection of the rim is desired. This type of rim is sometimes more desirable on flat bottom cups, such as pleated cups, which have a greater nesting depth and which are often dispensed from mechanical dispensers which require that the rim project a certain distance from the side wall of the cup in an outwardly direction.

Another form of the invention is illustrated in Figure 7, in which the rim generally indicated at 38 and shown in more detail in Figure 8, is rolled entirely within the cup so that the outermost portion 40 coincides with a plane through the side wall 42. In this case the innermost part 44 of the rim touches against the side 42 of the next succeeding cup and if the rim is sufficiently large, serves to create a greater nesting depth, as will be apparent by the fact that there is a space 46 between the outermost ply of the inside cup and the innermost ply of the outside cup, as shown in Figure 7. The type of cup

shown in Figures 7 and 8 has the advantage that the rim offers less resistance than the type of cup shown in Figures 1 to 4, or in Figures 5 and 6, and this is of importance when the cups are dispensed from dispensers having many dispensing projections. The rim, when rolled entirely in the cup, as shown in Figures 7 and 8, can also be used to hold in place a top, or the like.

Although the invention has been described primarily with reference to the convolutely wound type of cone-shaped cup, it may also be used on any other type of cone-shaped cup, including, for example, those cone-shaped cups of the types of construction shown in my United States Patent No. 2,056,893.

In the form of the rim shown in the various types of cups illustrated in the drawings, the cross-section is generally circular and the mouth edge terminates completely within the rolled rim, as exemplified by the edge 8 in Figure 4, but it will be understood that the invention is not limited to this particular type of rim and that the cross-sectional configuration may be other than round, as for example, elliptical, square, octagonal, or any other convenient shape.

Rims of the type herein described may be formed on cups by spinning, by the use of complementary dies, or by any other suitable means, in a single step or by a series of steps. The term "rolled," as used herein, is not intended to be limited to a circular configuration, but is employed generically to cover any formation by means of which the mouth edge of the container is turned in order to form a rim of the type described.

The invention is of outstanding importance, among other reasons, because it provides for the first time a type of rimmed cup which can be dispensed from practically any type of dispenser without destroying or damaging the rim. The invention is particularly important in the cone-shaped cup field because in this field today there are thousands of the conventional types of dispensers which cannot properly be used for dispensing a conventional rolled rim cone-shaped

cup, and, if they are used, give very unsatisfactory results. In many cases it is impractical or inexpedient to remove these conventional dispensers from their present locations and to replace them with other dispensers which would be satisfactory for the conventional type of rolled rim cone-shaped cup. The present invention obviates this difficulty and makes it possible for users having these dispensers to also have the advantage of rolled rim or beaded rim drinking cups.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A nestable paper cup of substantially true conical form adapted to be used in cone-shaped cup dispensers, said cup being formed with a bead at the mouth thereof rolled outside in with the free edge terminating within the roll of the bead.

2. A nestable paper cup of substantially true conical form adapted to be used in cone-shaped cup dispensers, said cup being formed with a bead at the mouth thereof rolled outside in with the free edge terminating within the roll of the bead, said bead being so disposed with respect to the side walls of the cup that a plane through the outer surface of the side walls of the cup passes through said bead.

3. A nestable paper cup of substantially true conical form adapted to be used in cone-shaped cup dispensers, said cup being formed with a bead at the mouth thereof rolled outside in with the free edge terminating within the roll of the bead, said bead lying outside of a plane through the outer surface of the side walls of the cup.

4. A nestable paper cup of substantially true conical form adapted to be used in cone-shaped cup dispensers, said cup being formed with a bead at the mouth thereof rolled outside in with the free edge terminating within the roll of the bead, said bead lying inside of a plane through the outer surface of the side walls of the cup.

WALTER E. AMBERG.