

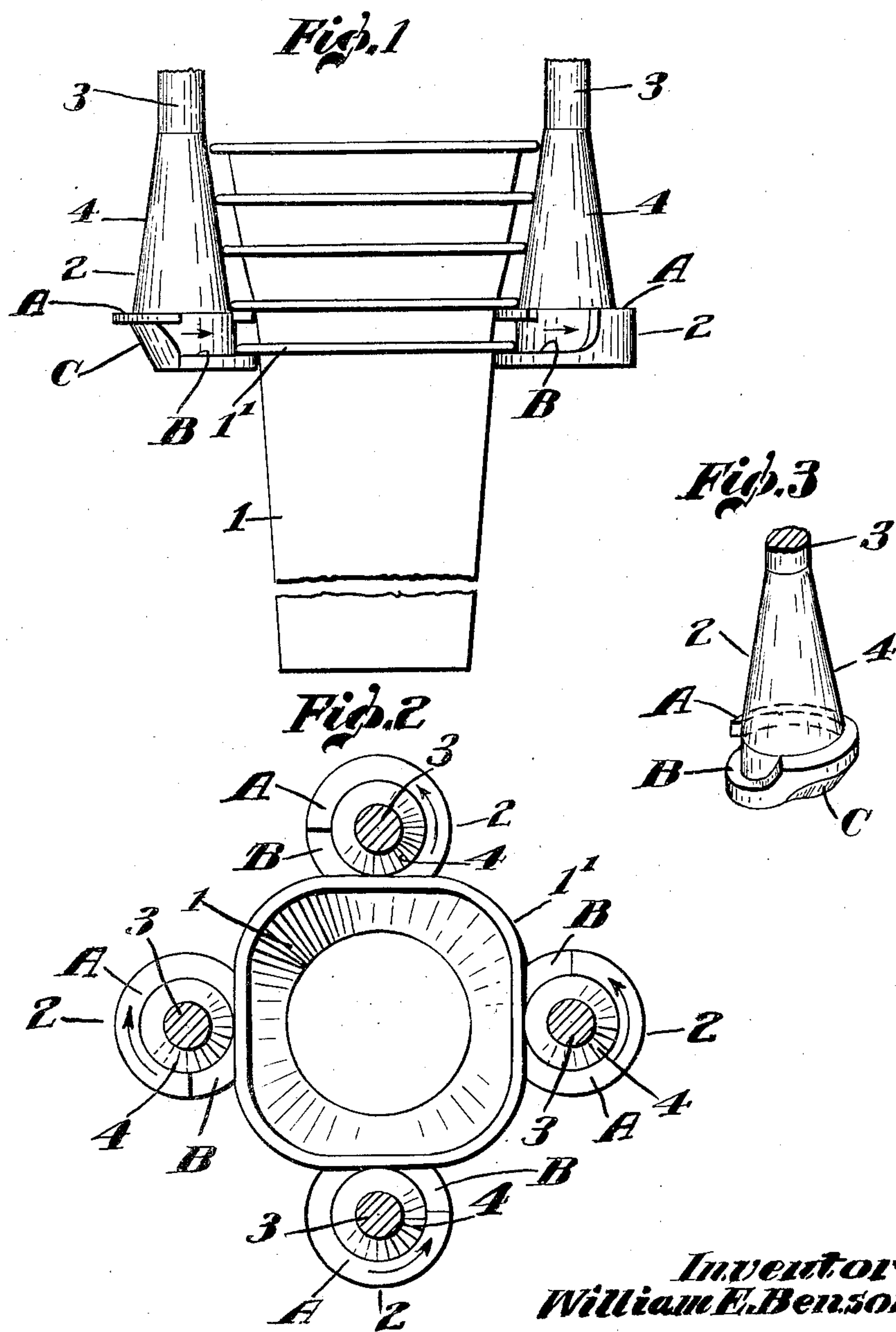
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DISPENSING APPARATUS

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## UNITED STATES PATENT OFFICE

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## DISPENSING APPARATUS

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This invention relates to the dispensing of nested articles such as paper cups or like containers and involves certain improvements upon the device disclosed in my pending application Serial No. 463,934 to which reference is made as containing a full discussion of the problems in the art.

In general my present invention provides for a more positive and dependable functioning of the apparatus to the end that the paper cups or other articles shall be positively separated and promptly released.

This object is obtained by the structure shown in the accompanying drawing wherein

Fig. 1 is a view through a series of nested cups dispensed by apparatus in accordance with my present invention.

Fig. 2 is a somewhat diagrammatic view in plan section illustrating the compressive action of the dispensing units upon the mouth of the cup or other article being dispensed, and

Fig. 3 is a detail view of one of the dispensing units removed from the machine.

In accordance with my general concept the articles to be dispensed as, for example, a nested column of cups 1 is contained in any suitable cup chute and the lowermost cups in the column are successively withdrawn for subsequent filling and capping.

Such withdrawal is effected by means of a series of rotating dispensing units indicated generally at 2 between which the cup column is centered. While not restricted to any specific number of units I find in practice that the symmetrical arrangement of four dispensing units as shown in this drawing is highly satisfactory.

The dispensing units are rotatable relative to the cup column and may be driven in any suitable manner. They may rotate either in a continuous rotary path or they may oscillate. As here shown the units are simultaneously revolved in a continuous rotary path. Such movement may be imparted in any suitable manner and inasmuch as this forms no part of my present invention I have simply indicated by conventional arrows on the drawing that the shafts 3 for the several units are rotated continuously in the same direc-

tion. In practice this may be accomplished by providing each shaft with a sprocket and driving the same by means of a sprocket chain.

In accordance with my present invention each unit is formed with a tapered section 4. Such taper starts at a point well above the lower ends of the units and extends towards the article supporting surface adjacent the lower end of the unit on which surface the projecting flanges 1' of the cups 1 in the cup column are adapted to be supported by and means of which the cups are successively ejected from the apparatus. The effect of such tapered sections is to subject each cup in the cup column to a progressive squeezing action as the cups descend therepast. This squeezing action distorts the cup slightly about its mouth as the cup progresses down the tapered sections of the dispensing units and such squeezing action reaches its maximum intensity at substantially the plane of the article supporting surfaces of the units.

This is indicated somewhat diagrammatically in Fig. 2 wherein the cup mouth is shown as having been distorted from its normal circular shape. By thus distorting the cup mouth the cup is thereby caused to be centralized with the series of dispensing units as the cup approaches the same and thus I avoid any tendency of the cup to feed improperly through the dispensing units due to variations in cup diameter at the mouth of the cup.

The cup supporting surfaces at the lower ends of the dispensing units are in the nature of cam surfaces which bear beneath the projecting flanges 1' of the cups. Such cam surfaces include a generally horizontal surface or ledge A on which the rolled edge 1' of the lowermost cup initially rests after passing down the tapered section 3' of the units 2. In this the pressure of the cups thereabove in the column urges the lowermost cup downwardly and outwardly through the units 2. As the units revolve in the direction of the arrows the supporting ledge A is removed from beneath the rolled edge of the lowermost cup and said cup drops by gravity, aided by the pressure of the col-



umn of cups onto the ledge B. This ledge is disposed below the plane of the ledge A with which it merges as best shown in Fig. 3. At this phase therefore in the rotation

5 of the units 2 the rolled edge of the lowermost cup is supported upon the ledge B and continues to be supported on said ledge through their rotation. In the further rotation of the units 2 the lower edge of the  
10 lowermost cup passes off the ledge B and is free from the units 2, the ledge B terminating in a downwardly and outwardly beveled face C which permits full release of the lowermost cup.

15 In the meantime the rotation of the units 2 has carried the ledge A in position to engage beneath the support the next uppermost cup in the column so that as one cup is freed the next cup above is supported.

20 Various modifications in the structure and use may all be resorted to without departing from the spirit and scope of my invention as defined by the appended claims.

25 What I therefore claim and desire to secure by Letters Patent is:

1. In a container dispenser, a stack for containing a column of nested containers, a series of dispensing units disposed symmetrically about the stack bottom axis, each  
30 unit comprising a member rotatable during the dispensing action about an axis parallel to the stack axis and each having a tapered section engaging and compressing the container and terminating in a container supporting surface in the form of an interrupted  
35 spiral the leads of which are disposed at different elevations about the member whereby progressively to engage and compress the outermost container in the column and detach it from the column.  
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2. In a container dispenser, a stack for a column of nested containers, a series of dispensing units disposed about the stack each unit comprising a member rotatable  
45 during the dispensing action about an axis parallel to the stack axis and each having a conical portion of gradually increasing radius overlapping the stack radius, and each terminating in a container releasing member and with said member progressively engaging and compressing the containers during the rotation of said units whereby so to shape said containers as to avoid structural variations thereof and to permit accurate centralizing and dispensing thereof.  
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3. In a container dispenser, a stack for a column of nested containers, a series of dispensing units disposed about the stack each unit comprising a member rotatable during  
60 the dispensing action about an axis parallel to the stack axis and each having a dispensing member having a conical portion of gradually increasing radius overlapping the stack radius, and each adapted progressively to  
65 engage and compress the lowermost contain-

ers during the rotation of said units whereby so to shape the same as to avoid structural variations thereof and to permit accurate delivery thereof from said dispensing member.

In testimony whereof I affix my signature.  
WILLIAM E. BENSON.

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