April 3, 1956 H. CAREW 2,740,551

CUP DISPENSING APPARATUS

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Fig. 1

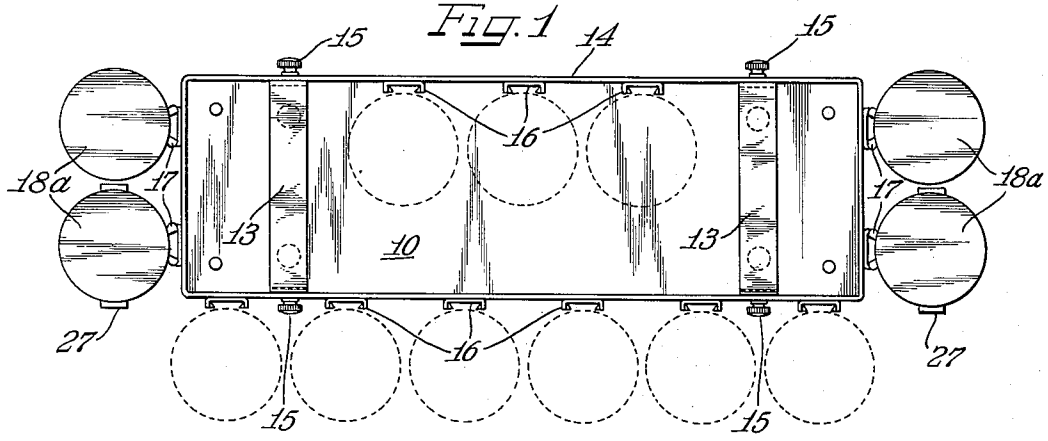


Fig. 2

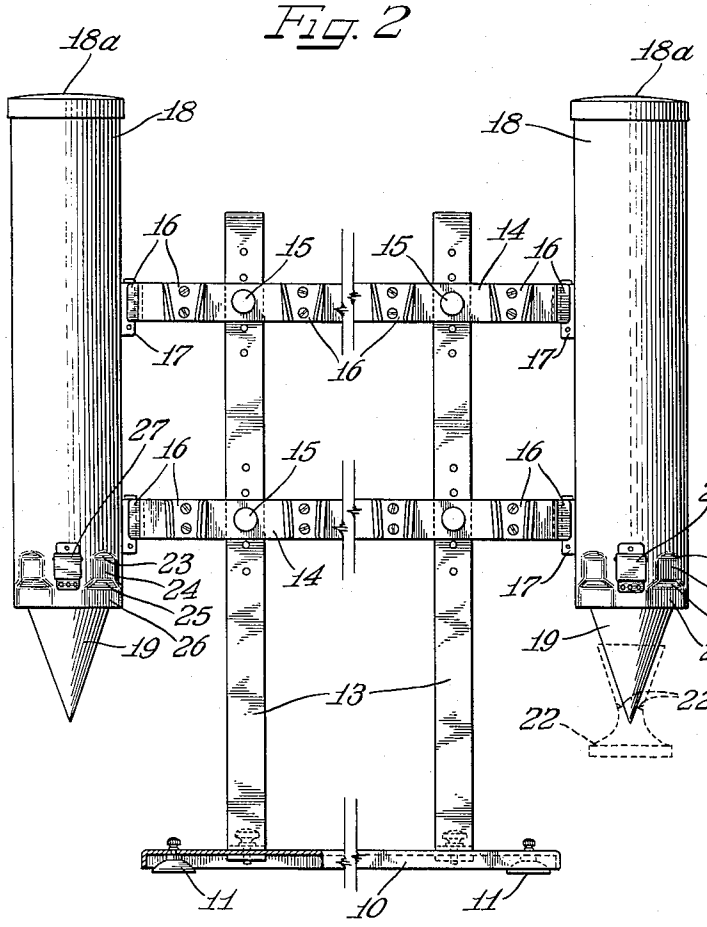
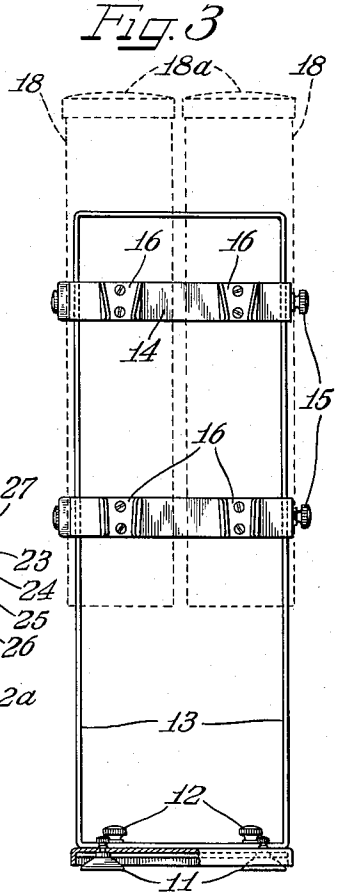


Fig. 3



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Fig. 4

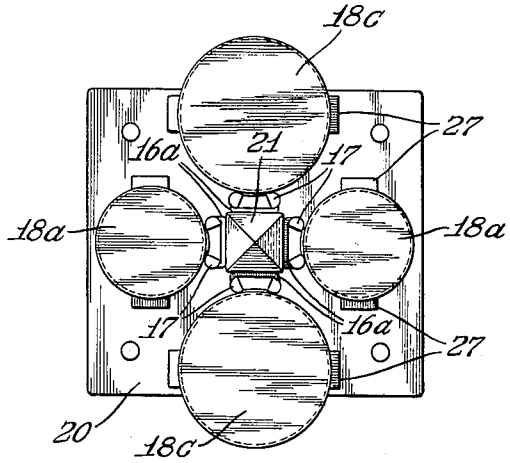


Fig. 5

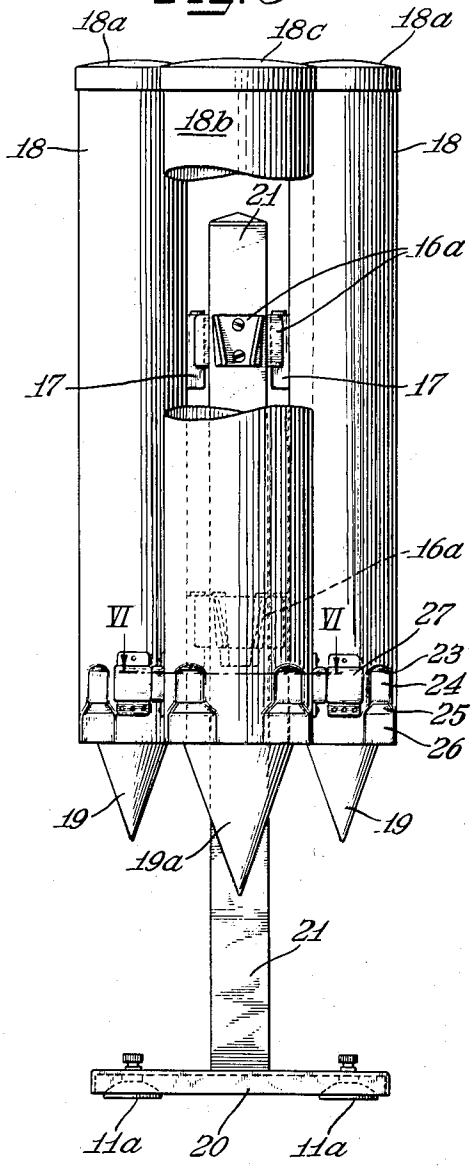
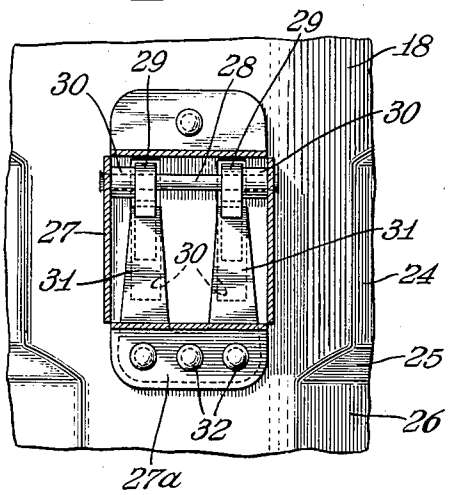


Fig. 10



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CUP DISPENSING APPARATUS

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Fig. 6

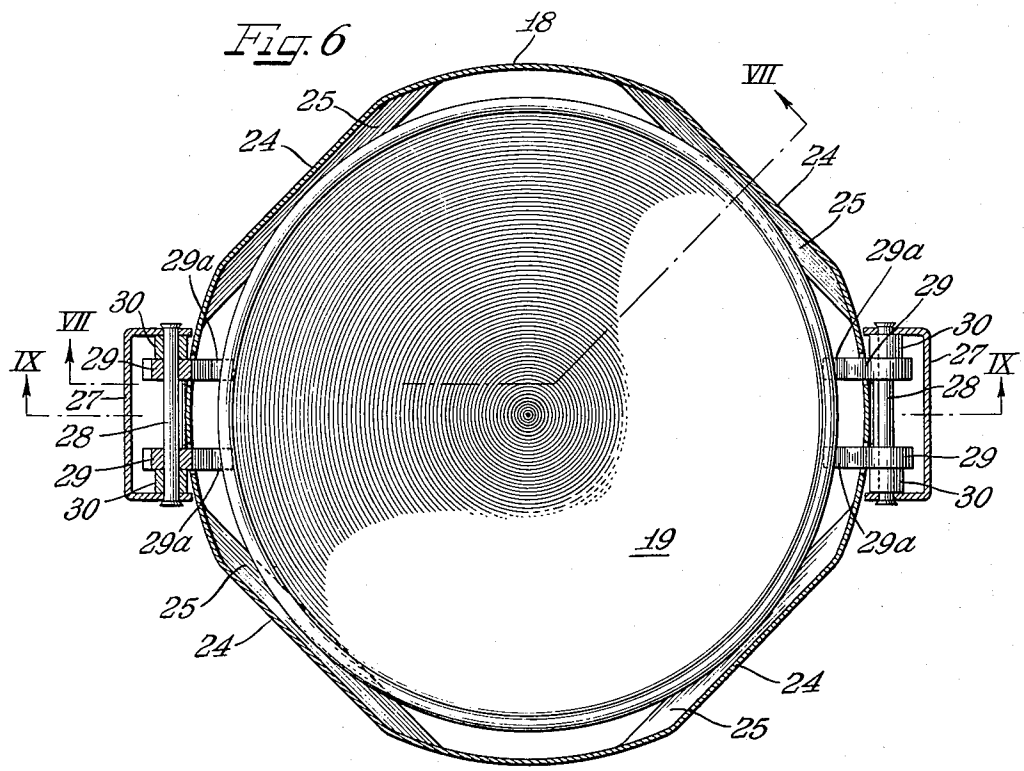
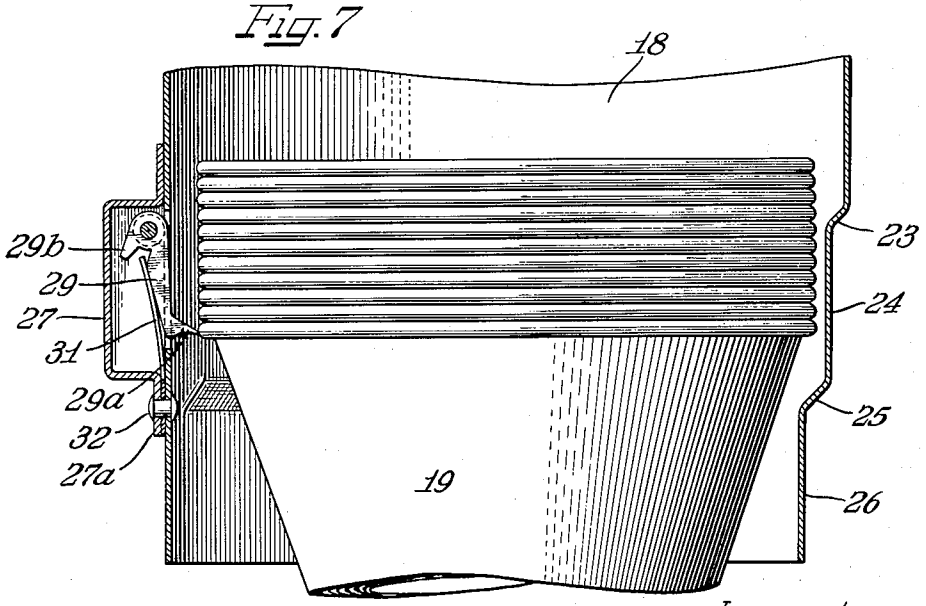


Fig. 7



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CUP DISPENSING APPARATUS

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Fig. 8

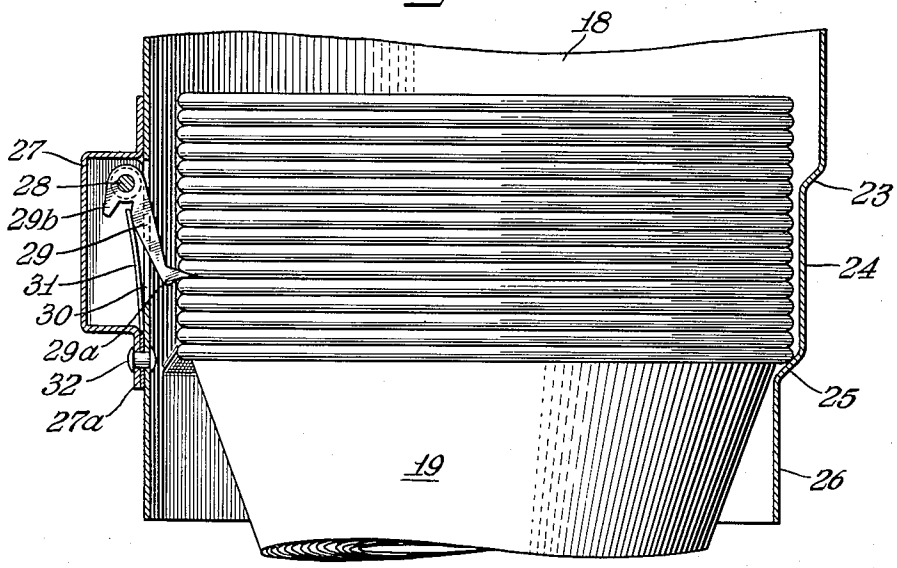
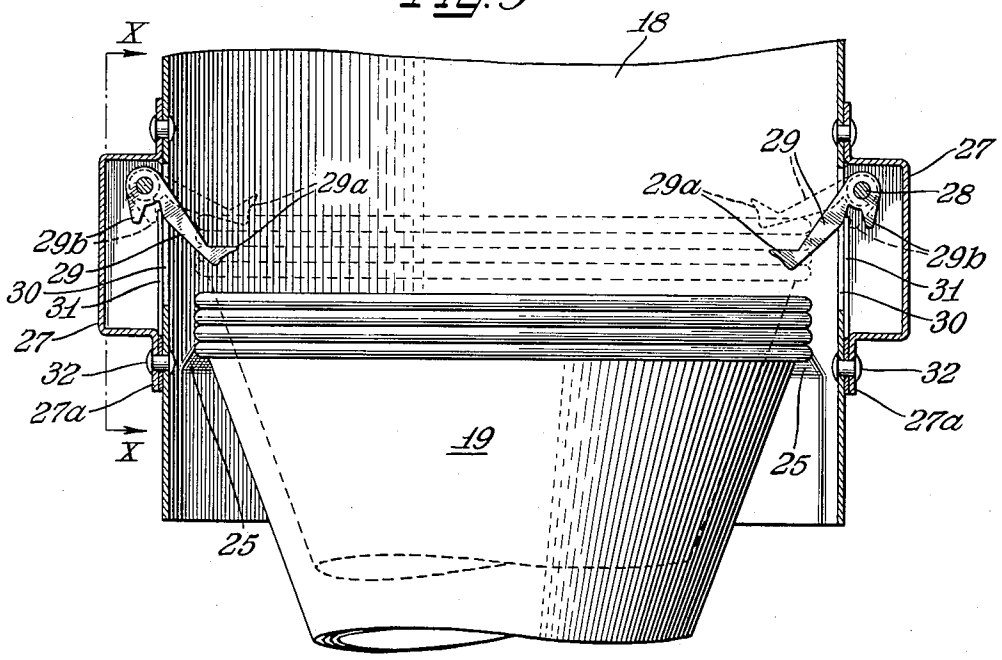


Fig. 9



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United States Patent Office

2,740,551

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CUP DISPENSING APPARATUS

Herman Carew, Easton, Pa., assignor to Dixie Cup Company, Easton, Pa., a corporation of Delaware

Application April 7, 1950, Serial No. 154,713

1 Claim. (Cl. 221—63)

This invention relates to cup dispensing apparatus, and particularly to apparatus which may be effectively employed in the storage and dispensing of disposable conical paper cups such as are used at soda fountains and other dispensatories of liquid beverages and semi-liquid confections.

This use of disposable paper cups includes several considerations among which are storage and use of the cups under a high degree of sanitation, and rapidity and ease in the dispensing of the individual cups for use.

Part of these problems were solved by the invention disclosed and claimed in my application for patent, Serial No. 510,311, filed November 15, 1943, now Patent No. 2,509,132, which provides a cup holder, the throat of which embodies means for engaging the exterior of the cup at the end of a nested stack and withdrawing the same from the stack in position for use in the cup holder. This operation is rapid and involves a minimum of manual effort. Furthermore, it obviates the necessity of the operator's hand touching the cups, thus contributing to sanitation.

With such type of operation, however, it is necessary that the stack of cups be restrained from longitudinal movement in order that the holder may operate to engage the endmost cup for removal therefrom from the stack. In order to accomplish this restraint against longitudinal movement of the stack it has been customary to place the stack of nested cups on a firm foundation with the points of the cups extending upwardly. In dispensing from this stack the holder is inverted to engage and remove the uppermost cup from the stack. This requires that the entire stack be left exposed in order to readily present the endmost cup to the holder as the stack diminishes in height. Such necessity of the stock remaining exposed is obviously undesirable from a sanitary standpoint. Neither does the use of open unconfined stacks facilitate the orderly arrangement of a supply of cups such as is required for use at a soda fountain or similar establishment.

While the above-described procedure is rapid, the fact remains that the necessity of inverting the cup holder to engage and remove the cup therefrom also involves extra effort on the part of the operator.

The present invention overcomes the foregoing disadvantages by making it possible to store the stacks of nested cups in enclosed containers with the bottom portion of the endmost cup projecting therefrom in position to be engaged and grasped by the cup holder without the necessity of inverting the same prior to such engagement. This desired end is accomplished by the provision of a mechanism which resists longitudinal movement of the stack when the holder is pressed over the endmost cup and which at the same time permits ready removal of that individual cup from the stack.

By using closed containers for the stacks of nested cups to be dispensed it is also possible, in accordance with the present invention, to mount a plurality of such containers on a single supporting stand thus conserving

space and facilitating access to the various stacks and to various sizes of cups carried by such separate stacks. Furthermore, the use of such closed containers keeps the cups free of dust and other foreign matter thus enhancing maintenance of the cups in sanitary condition.

It is therefore an important object of the present invention to provide a dispenser for a stack of nested cups wherein the stack is restrained from upward longitudinal movement when upward pressure is applied to the lowermost cup of the stack.

It is a further important object of this invention to provide an enclosed container for a stack of nested cups wherein the weight of the stack is carried by means within the container which include means for resisting upward movement of the stack when upward pressure is applied to the lowermost cup of the stack for engagement therewith and removal therefrom by a cup holder.

It is also an important object of this invention to provide a dispenser for a stack of nested cups wherein laterally extending means are provided for engagement with the rims of cups intermediate the ends of the stack for resisting longitudinal movement of the stack when pressure is applied to an end thereof.

It is a further object of this invention to provide a stand having a plurality of dispensing containers closed at their upper ends and suspended from standards mounted on the stand and having the lowermost cups of nested stacks contained therein projecting from the lower ends of said containers above the stand, certain at least of said containers being provided with dispensing mechanism that restrains longitudinal movement of the stack within the containers when upward pressure is applied to the lowermost cup in the dispensing thereof.

Other and further important objects of this invention will be apparent from the specification and the accompanying drawings. The invention (in a preferred form) is shown on the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a plan view showing a supporting stand equipped with a plurality of tubular dispensers closed at their upper ends and certain of which are provided with the dispensing means of this invention.

Figure 2 is a side elevation view with parts broken away and parts in section showing a stand equipped with the dispensers of this invention.

Figure 3 is an end elevation view with parts shown in section of the stand shown in Figure 2 with the dispensing containers carried thereby shown in dotted lines.

Figure 4 is a top plan view of another supporting stand equipped with dispensers embodying the principles of this invention.

Figure 5 is a side elevation view with parts broken away of the stand shown in Figure 4.

Figure 6 is an enlarged sectional view taken on the line VI—VI of Figure 5.

Figure 7 is an enlarged fragmentary sectional view taken on the line VII—VII of Figure 6 showing the stack restraining means in the position assumed by its during filling or loading of a dispensing container.

Figure 8 is a view similar to Figure 7 showing the stack restraining means in normal stack restraining position.

Figure 9 is a section on the line IX—IX of Figure 6 showing the stack restraining means in normal position and in the position assumed thereby when the dispenser is empty, the latter position being shown in dotted lines.

Figure 10 is an enlarged fragmentary sectional view on the line X—X of Figure 9.

As shown on the drawings:

Figures 1 to 4, inclusive, illustrate various arrangements of supporting stands which may be used to carry

detachably mounted thereon, a plurality of dispensing containers which are so mounted that the endmost cups of stacks of conical cups contained therein are spaced upwardly above the base of the supporting stand and project in a downward direction so that the weight of the nested stack of cups therein will tend to force the endmost cup of the stack outwardly of the dispensing container as the preceding endmost cup is removed therefrom. These figures show containers of different diameter which may be used to carry nested stacks of cups of different sizes and since certain of these dispensers need not be adapted for use with dispensing types of cup holders to be hereinafter referred to, it is not necessary that all of these tubular containers be provided with the improved mechanism of this invention.

The stand shown in Figures 1, 2, and 3 includes a base member **10**, preferably of metal, and conveniently provided with non-slip vacuum cup foot members **11** which engage the surface on which the stand is supported. Secured to the base member **10** in any suitable manner as by thumb screws **12** are a pair of rectangular uprights **13** which project upwardly from the base member and afford a support for a vertically spaced pair of rectangular dispenser supporting frame members **14** secured to said uprights **13** in any suitable manner as by wing nuts **15**.

Affixed to the rectangular frame members **14** in any desired spacing and position are vertically aligned wedge-shaped socket members **16** which are of less width at their lower than at their upper ends and which are adapted to detachably receive wedge-shaped bosses **17** attached to the side walls of tubular container members **18** in which nested stacks of conical cups **19** are carried. The tubular container members **18** are preferably provided with removable covers **18*a*** to permit of the insertion of a stack of nested cups therein with the points downwardly said covers to be thereafter replaced to prevent ingress of dirt and other foreign matter into the interior of said containers.

It will be further apparent from the foregoing description that the individual containers **18** may be readily removed from the supporting stand by the mere expedient of lifting the same in an upward direction whereupon the bosses **17** are withdrawn from the wedge-shaped sockets **16**. As shown in Figure 1, the sockets **16** may be mounted on the forward faces of the frame member **14**, thus being on the inner faces of said frame member at the rear of the stand and on the forward faces of said frame member at the front of the stand. Said sockets **16** may be attached to the frame members by riveting, welding or in any suitable manner. As shown in Figure 1 the frame **14** may carry a relatively large number of the tubular members **18**, certain of which may be equipped with standard dispenser mechanisms well known in the art, and certain others of which may be equipped with the improved dispensing mechanism to be hereinafter described.

Figures 4 and 5 show a somewhat different supporting stand arrangement, the stand here comprising a base member **20** with a centrally positioned upright supporting member **21** secured thereto, preferably at the center of said base member. Non-slip members **11*a*** similar to the members **11** previously described may be provided to cushion the base **20** to prevent slipping thereof on its supporting surface.

Secured to each face of the support member **21** is a socket member **16*a*** identical in construction with the socket members **16** previously described. Here again these socket members **16*a*** are secured to the support member or standard **21** by means of screws, rivets, welding, or in any suitable manner. If desired, similar support members **16*a*** may be affixed to the standard or support member **21** in vertical alignment therewith, longitudinally spaced therefrom and approximately at a midpoint of the standard or support.

In the structure shown in Figures 4 and 5 four dispensing containers are carried by the supporting stand **20—21**. As in the previous structure these dispensing containers are so carried that the endmost cups of nested stacks of cups carried thereby are positioned at a point well above the upper surface of the standard. In the structure shown in these figures I have illustrated dispensing containers in pairs of different sizes so as to have available to the operator within convenient reach required different sizes of cups to be dispensed. In Figures 4 and 5 I have designated the larger dispensing containers by reference numerals **18*b*** and their covers by the reference numerals **18*c***. Except for a difference in size, however, these dispensing containers are identical with the dispensing containers **18—18*a*** previously described. The endmost cup of the stacks of cups contained within dispensing containers **18*b*** has been designated by the reference numeral **19*a***.

It will be apparent from the foregoing description that the supporting stands for the dispensing containers of this invention afford a very flexible arrangement for conveniently supporting and mounting a plurality of dispensing containers to hold nested stacks of cups of different sizes. Furthermore, these supporting stands achieve the desirable result of holding the endmost cup well above the base of these supporting stand where it may be engaged by a cup holder for removal of the endmost cup from the stack in accordance with the invention disclosed in my application Serial No. 510,311, now Patent No. 2,509,132 aforesaid.

As shown in dotted lines in Figure 2, a cup holder **22** is as positioned by the operator in the withdrawal of the endmost cup **19** from the nested stack of cups contained within the tubular member **18**. This cup holder **22**, which is of hourglass shape, is open at both ends and the upper portion of its interior is so shaped as to conform to the exterior of the end of the conical cup **19** carried thereby. When the operator places this cup holder **22** over the end of the endmost cup of the stack and exerts an upward pressure, the exterior of the cup is engaged by protuberances shown diagrammatically at **22*a*** within the interior of the holder and those protuberances effect such frictional engagement with the exterior surface of the cup that upon downward movement of the holder, the cup is withdrawn from the stack while being retained in its position within the holder. The initial movement of this operation requires application of an upward force, or a force inwardly and longitudinally of the container. If the cup holder is to operate satisfactorily in its engagement with the cup for withdrawal from the stack, it is obvious that longitudinal movement of the stack of cups in response to such upwardly or inwardly directed force must be restrained. This desired result is accomplished in accordance with the present invention by means of the structure illustrated in Figures 6 to 10, inclusive, and will now be described. Referring to Figure 6 it will be noted that the lower end of the tubular member **18** is pressed inwardly along four equal spaced sections of its circumference to provide what amount to guiding shoulders **23** and restricting walls **24** which tend to more accurately position the lower end of the stack of nested cups **19** within the tubular member. The restricting walls **24** terminate in further inwardly extending shoulders **25** substantially coextensive in length with the shoulders **23** and positioned directly beneath the same, said shoulders **25** being so positioned as to engage sections of the rim of the lowermost cup **19** and thus support the nested stack of cups within the container. The diametrical distance between oppositely positioned shoulders **25** is such that only a portion of the rim of the lowermost cup overlaps the shoulders (see Figure 6) wherefore upon slight distortion the lowermost cup may be readily withdrawn past the rigid or non-yielding shoulder and past portions of the container **26** depending from such shoulders **25** for individual dispensing of such cup. This procedure and arrangement as to the individual dispensing of cups

from the containers **18** is in general accord with procedure heretofore followed in the individual dispensing of cups from nested stacks of cups mounted within similar tubular containers.

As previously noted, however, when longitudinal force upwardly and inwardly toward the container is applied to the endmost cup **19** of the stack of nested cups within the container, such force will tend to move the nested stack of cups within the container longitudinally upwardly and inwardly and thus prevent effective gripping of the cup by the cup holder **22**.

The mechanism of this invention shown in detail in Figures 6 to 10, inclusive, is provided for restraining and preventing this inward and upward longitudinal movement of the nested stack of cups when such external inward and upward force is applied to the endmost cup by the cup holder.

The mechanism so provided is mounted within housings **27** positioned diametrically opposite each other and suitably secured to the exterior of the tubular member **18** as shown in Figures 6 to 10, inclusive. Secured within each of the housings **27** is a shaft **28** which provides a pivotal support for a pair of pawls **29** of identical construction, the pawls **29** being mounted on the shaft and spaced from the end walls of the housing **27** by spacers **30**. Each of the pawls **29** is provided with an inwardly projecting foot member **29*a*** which is adapted to be engaged between the rims of adjacent cups in the nested stack of cups **19** as shown in Figure 8 and when so engaged will resist upward and inward movement of that nested stack when an upward and inwardly directed longitudinal force is applied to the endmost cup of the stack. Said pawls **29** are normally held in the position shown in Figure 8 by flat leaf springs **31** which engage the outside of the pawls as shown in Figures 7, 8, and 9, and which are secured between the lower flange **27*a*** of the housing **27** and the exterior surface of the tubular member **18** by rivets **32**. The free ends of the leaf springs **31** project upwardly into a recess between the rear side of the pawl **29** and a stop **29*b*** formed as a tail member on the pawl and integral therewith, which upon inward movement of the pawl to the dotted line position shown in Figure 9, engages the inner side of the leaf spring **31**, thus limiting inward and upward movement of the pawl.

Figure 7 illustrates the position of the pawls **29** and the feet **29*a*** thereof as the nested stack of cups **19** is being placed in the container. It will be noted that during this operation the feet **29*a*** of the pawls are pushed outwardly against the action of the spring **31** to permit the nested stack of cups to assume the position shown in Figure 8 at which time the springs **31** force the pawls inwardly so that the feet **29*a*** thereof engage between the rims of adjacent cups in the nested stack and by reason of such engagement resist upward movement of the stack when an upwardly and inwardly directed force is applied thereto as by the application of a cup holder to the endmost cup for the removal of a cup.

When the dispensing container **18** is empty, or substantially empty, so that the upper cup of the remaining stack is beneath the foot of the pawl **29**, then the pawl under influence of the spring **31** assumes the dotted line position shown in Figure 9. With the pawls in that position they are first engaged by a new stack of nested cups which is being inserted into the tubular member **18**, forced to the position shown in Figure 7, and finally when the endmost cup of that stack engages the shoulder **25** reassume the position shown in Figure 8 under the influence of the spring **31**. It will thus be noted that the provision of these pawls for restraining movement in an inward longitudinal direction in no way interferes with the replenishment of stacks of nested cups within the depenser.

At the same time it will be observed that when the pawls **29** with their feet **29*a*** are in operative position, they do effectively resist upward and inward movement of the stack in response to a force applied to the endmost cup in that direction. By reason of this arrangement and the restraining of such inward force, the cup holder **22** may be engaged against the endmost cup of the stack with sufficient force to cause frictional or distorting engagement of the protuberances or other inward extensions **22*a*** with the exterior of the endmost cup and thus permit the subsequent withdrawal of that cup from the stack past the shoulders **25** while it is still retained within the cup holder in position for prompt use.

It will thus be noted that this invention makes it possible to use such cup holder method of dispensing of stacks of nested cups which are stored within closed containers to prevent access of dirt and other foreign matter to the cups contained therein. At the same time the supply within the individual containers may be readily replenished by the simple expedient of removing the cover and inserting a new stack. By reason of the fact that the points of the cups extend downwardly it is not necessary that the operator invert the cup holder in order to position a cup therein and withdraw the same from the nested stack.

While I have shown dispensers wherein the feed of the cups to the shoulders **25** is due to gravity and is by reason of the weight of the cups in the nested stack, it will be obvious that this invention might be applicable to dispensing containers held in other than a vertical position with the force of gravity for feeding the cups toward the shoulders **25** supplemented or replaced by follower springs or similar mechanisms well known in the art.

It is understood that details of construction may be varied without departing from the principles of this invention and it is, therefore, not intended to limit the patent granted hereon otherwise than necessitated by the scope of the appended claim.

I claim as my invention:

A paper cup dispenser comprising a stand having a base member for engaging a supporting surface, a support standard positioned and carried uprightly on said base member, and at least one dispensing container carried on said support standard, each said dispensing container comprising a vertically disposed tubular member having a charging opening at the top end and a discharge opening at the bottom end, a cover member for closing said charging opening, said tubular member having radially inwardly extending portions adjacent said discharge opening forming restricting wall portions for guiding a stack of paper cups and terminating in a plurality of circumferentially spaced radially inwardly extending stop shoulders for underlying the lower side of the rim on the lowermost cup in the stack of cups, said stop shoulders having circumferentially alternate spaces therebetween, whereby slight distortion of the lowermost paper cup will withdraw the said rim past said stop shoulders, pivot shafts secured to said tubular member on diametrically opposite sides thereof and being spaced axially adjacent the discharge opening, a pair of spaced pawls on each respective pivot shaft, each pawl having a lever arm portion pivotally carried by a corresponding pivot shaft and terminating in a foot member extending towards the discharge opening, each said foot member having a lower concave surface and a relatively flat sharp toe for engaging on and between adjoining cup rims, and resilient means operatively connected between said tubular member and said pawls biasing said pawls radially inwardly into position to resist inward and upward movement of the stack of cups by transmitting cup-setting thrusts applied to the lowermost cup to the tubular member, said pawls being displaced radially outwardly against the biasing force whenever the stack of paper cups is replenished or moves to replace a low-

ermost cup in outwardly projecting relation to the discharge opening.

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