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H. C. BEHRENS ET AL

PAPER PLATE DISPENSER

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Fig. 1

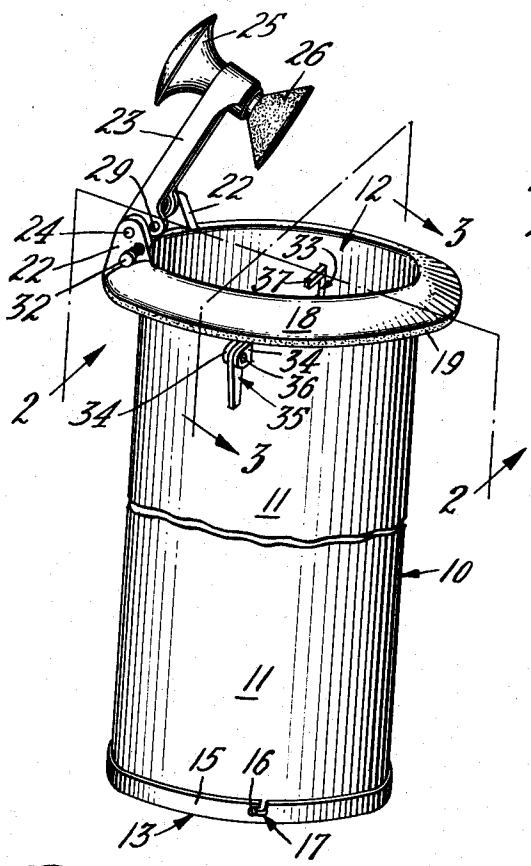


Fig. 2

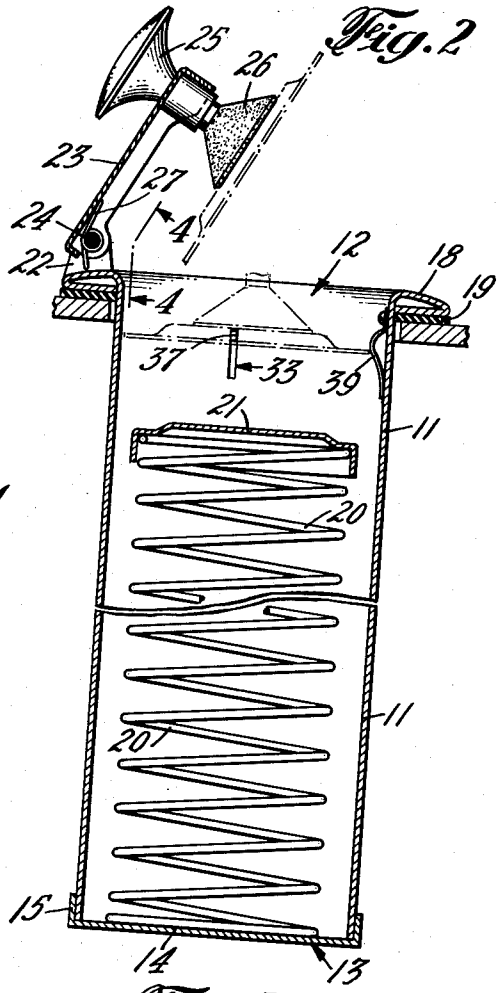


Fig. 4

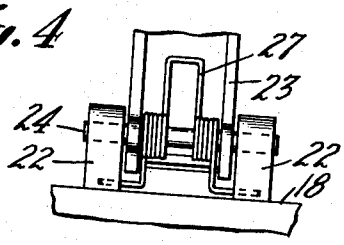


Fig. 3

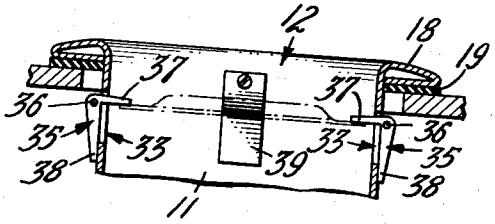
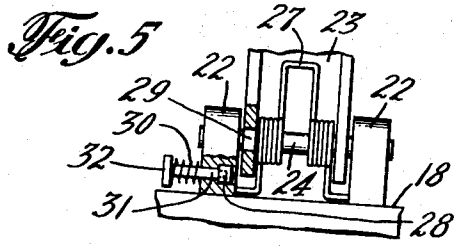


Fig. 5



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PAPER PLATE DISPENSER

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8 Claims. (Cl. 221—41)

The present invention pertains to dispensers for disposable plates of the flexible fibre or plastic type and more particularly to novel semi-automatic means for quickly and efficiently dispensing such plates, one at a time, from a stack of nested plates.

Disposable plates made of fibre or plastic have met with increasing acceptance and use in recent years. Particularly in commercial and institutional feeding operations, such as cafeterias, hospital kitchens, etc., the use of such plates has been greatly accelerated, because their use makes possible high standards of cleanliness without need for the costly dishwashing equipment and operations necessarily involved in the use of china or metal ware. Large quantities of paper plates may be easily handled and compactly stored due to their light weight and close nesting feature, and such plates may be made in a variety of shapes and finishes which are both very attractive and durable.

However, some problems have been experienced in the use of disposable plates. Because of their thin construction and close nesting feature, it is sometimes difficult to separate and remove the plates one at a time as they are to be used from a nested stack. In such instances a user may initially remove a number of plates from the stack, after which one may be separated for use and the remainder replaced. It is obvious that such extra handling is inefficient and may lead to delays during peak feeding periods which are aggravating and inconvenient. Such extra handling may also result in the soiling or contamination of the unused plates which are replaced on the stack.

Furthermore, the difficulty in separating and removing single plates generally necessitates that the stacked plates be placed on an open and accessible part of the work surface, since to store them on a cabinet shelf or in a recessed container would increase the possibility of trouble in separating and removing single plates. Such open surface storage not only clutters and takes up valuable working area, but increases the likelihood that the stored plates may be contaminated by being contacted by utensils, foreign matter, etc., with consequent waste. Open counter top storage of large quantities of stacked plates also increases the possibility that the stack may be overturned by careless or inadvertent sidewise contact with a foreign object, since such a stack would have little resistance to displacement in the sidewise direction.

An object of the present invention is to provide a dispenser for disposable plates which will overcome the problems hereinbefore pointed out.

Another object is to provide such a dispenser which will permit speedy and efficient semi-automatic dispensing of the plates one at a time as they are needed.

Another object is to provide such a dispenser which can be recessed into the work surface, thereby eliminating clutter of the working area and freeing valuable space for additional working area.

Another object is to provide such a dispenser which can be quickly and conveniently loaded from the top with an ample supply of plates to take care of periods of peak demand.

Another object is to provide such a dispenser which will protect the stored plates from contamination and soiling, thereby maintaining the highest standards of sanitation and cleanliness.

Another object is to provide such a dispenser which is simply constructed and easy to disassemble for cleaning and maintenance.

A further object is to provide such a dispenser which utilizes inexpensive materials and is simple to manufacture.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

The elements of the present invention consist of a tubular container into which a nested stack of inverted disposable plates may be inserted from the upper dispensing end, means for urging the plates towards the dispensing end, retention members which automatically retract when plates are being inserted into the container but which normally prevent the stack of inserted plates from being ejected from the container, and a dispensing means which grips the uppermost plate in the dispenser, disengages it from the action of the retention members, and then raises it to an upright position where it may be manually removed by the user.

Referring to the drawings:

FIGURE 1 is a perspective view of a disposable plate dispenser embodying the features of the present invention;

FIG. 2 is a sectional view taken substantially along line 2—2 of FIG. 1;

FIG. 3 is a sectional view taken substantially along line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary view taken substantially along line 4—4 of FIG. 2;

FIG. 5 is an enlarged fragmentary view of the locking pin with portions broken away to show details of the structure.

As a preferred or exemplary embodiment of the instant invention, FIGS. 1 and 2 show a semi-automatic dispenser for circular disposable plates generally designated **10** comprising a cylindrical tubular container **11** having a dispensing end **12** and a bottom **13**. The bottom **13** may be integral with the container **11** or detachable therefrom. In the preferred embodiment, the bottom **13** is detachable, being composed of a face portion **14** and a skirt portion **15**. The skirt **15** fits over the outside of the bottom end of the container **11** and is secured thereto by outwardly appending pins **16** on the container wall which engage the bottom **13** by means of cam-type slots **17** in the skirt. By this securing means, the bottom **13** can be quickly disassembled and assembled to the container **11**, thereby facilitating periodic cleaning of the dispenser.

The dispensing end **12** has a raised collar **18** which is integral the container **11** and on which the dispenser **10** rests when used in a recessed installation. The collar **18** is of sufficient height to prevent the dripping of liquids from the surface into which the dispenser **10** is recessed to the interior of the container **11**. The under side of the collar **18** has a flexible gasket **19** to effect a seal between the collar and the surface into which the dispenser **10** is recessed, thereby preventing the seepage of liquids between the collar and the surface on which it rests and thence down the exterior wall of the container **11**.

Disposed within the container **11** is a means for urging the plates which are inserted into the container towards the dispensing end **12**. In the preferred embodiment, this consists of a compression spring **20** which rests on the bottom **13** and has a plunger **21** on its upper end to bear upon and push the inserted stacked plates upwardly towards the dispensing end **12**. Preferably, though not necessarily, the plunger **21** has substantially the same contour as the inside of food-holding surface

of the plate on which it bears, so that it nests and maintains alignment with the plates.

Attached to the upper surface of the collar 18 are brackets 22 to which the dispensing arm 23 is pivotally attached by means of the hinge pin 24. On the free end of the dispensing arm 23 are a handle knob 25 and a pick-up means consisting of a soft rubber suction cup 26. The suction cup 26 is positioned on the dispensing arm 23 so that the cup will make gripping contact with the exposed outside or bottom surface of the uppermost plate in the container when the arm 23 is oscillated downwardly to a position whereby it is substantially parallel to the dispensing end 12.

The dispensing arm 23 is spring biased upwardly by a torsion spring 27 disposed on the hinge pin 24 so as to exert a moment on the dispensing arm automatically raising it to the upright position after it has been manually lowered to the position in which the suction cup 26 contacts and grips the uppermost plate. When the dispenser 10 is not being used, the dispensing arm 23 may be secured in the lowered position by means of the locking pin 28 which is mounted in the bracket 22 and through which it may be pushed to engage the locking hole 29 in the dispensing arm. As shown in FIG. 5, the locking pin 28 is normally maintained in the unlock position by the action of the spring 30 disposed on the shank 31 between the head 32 of the locking pin and the bracket 22. When the locking pin 28 is in the lock position, the force of the spring 30 is insufficient to overcome the frictional force exerted on the pin by the upwardly spring loaded dispensing arm 23, and consequently the locking pin 28 remains in the lock position. When the dispenser 10 is to be used, a slight pressure applied to the handle knob 25 automatically releases the locking pin 28 permitting the spring 30 to retract it within the bracket 22 and freeing the dispensing arm 23 for use.

Adjacent the dispensing end 12 are two apertures 33 in the container wall with retention lug mounts 34 ingral the exterior surface of the container 11 adjacent both sides of each aperture. L-shaped retention lugs 35 are pivotally attached to the lug mounts 34 by pins 36 which pass through the mounts and through the retention lugs substantially at the intersection of the two arms of the lug. One arm of the retention lug 35 is shorter and lighter in weight than the other. Normally, the shorter arm 37 extends transversely through the aperture 33 and into the interior of the container 11 where it bears upon the upper edge of the uppermost plate, thereby retaining the stacked plates within the container. Upward oscillation of the shorter arm 37 beyond the position at which it is substantially perpendicular to the container wall is prevented by the longer arm 38 which extends downwardly away from the dispensing end 12 and abuts the exterior surface of the container 11 when the shorter arm 37 is substantially perpendicular to the container wall. The shorter arm 37 is free to oscillate downwardly, and when contacted by plates being inserted into the container 11, the shorter arm 37 is automatically pushed out of the path of the entering plates. After the plates have been inserted into the container 11, the longer arm 38 being heavier than the shorter arm 37 causes the retention lug 35 to rotate about the pin 36 until the longer arm 38 again abuts the container 11. The shorter arm 37 is then in position to engage the plates and prevent their ejection from the container 11.

It is to be understood that springs or other means may also be used to insure that the retention lugs 35 will normally assume the position for retaining the stacked plates within the container 11. With the preferred embodiment shown, such additional means will generally not be necessary when the dispenser 10 is used in the vertical position, which will usually be the case. If the dispenser 10 is to be installed in a position other than vertical, the gravity force on the retention lug 35 may not be sufficient, and it may be desirable to have the lugs 35 spring biased

toward the position whereby the shorter arm 37 will engage the plates and prevent their ejection from the container 11.

A guide spring 39 consisting of a thin metal strip is attached to the interior of the container opposite the point of attachment of the bracket 22 and substantially in the plane of the retention lugs 35. The guide spring 39 directs the plates towards the retention lugs 35 and maintains their alignment with the lugs when the uppermost plate is being removed by the dispensing arm 23.

The dispenser 10 will operate satisfactorily when the retention lugs 35 are located substantially on the diameter of the container 11 which is perpendicular to the dispensing arm 23, with the suction cup 26 being located on the dispensing arm so as to engage the uppermost plate substantially midway between the retention lugs. In the preferred embodiment, however, the retention lugs 35 are located so as to engage the edge of the uppermost plate at two points on a line perpendicular to the dispensing arm 23 which is closer to the hinge pin 24 than the corresponding distance between the hinge pin and the center of the inserted plates. Also, the suction cup 26 is positioned on the dispensing arm so that it will grasp the uppermost plate at a point slightly beyond the center of the plate as measured from the hinge pin 24. By thus positioning the retention lugs 35 and suction cup 26, the side of the plate remote from the hinge pin 24 is raised initially as the dispensing arm 23 is raised, permitting the plate being dispensed to slide out from beneath the retention lugs 35 smoothly and readily, thereby minimizing the bending of the edges of the plate during the dispensing operation.

It can be readily seen that the novel semi-automatic dispenser for disposable plates described herein will have great utility in mass feeding operations of the commercial and institutional type. The simplicity of construction and ease of operation are especially adapted to achieve maximum efficiency, since the dispenser may be quickly and easily loaded from the top with a large supply of plates and since it insures speedy single-plate dispensing with a minimum of effort. The highest standards of cleanliness are maintained, because each plate is dispensed from a recessed inverted position, with no change of foreign matter splashing on the clean top surface of the plate and because the dispenser itself is easily disassembled for periodic cleaning and maintenance.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction, and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

We claim:

1. A plate dispenser comprising a tubular container adapted to receive therein a stacked quantity of inverted flexible disposable plates through an upper dispensing end, means for urging said inserted plates towards said dispensing end, a dispensing arm pivotally mounted to said dispensing end and benig oscillatable towards and away from said inserted plates, means integral with said arm for engaging and gripping the uppermost plate upon downward oscillation of said arm, the center of said gripping means being disposed a predetermined distance from the pivotal axis of said arm, and two opposed retention members oscillatably mounted on said container adjacent said dispensing end adapted to engage the upper peripheral surface of the uppermost plate to retain the inserted plates within the container and to retract out of the way when contacted by plates being inserted into the container, said retention members engaging said uppermost plate in a region immediately adjacent to and extending toward said pivotal axis from a line parallel to said pivotal axis and passing through the

center of contact of said gripping means with said uppermost plate, the sole retention means for said plates engaging said uppermost plate in said region whereby upon lifting the uppermost engaged plate to disengage it from said retention members said plate is flexed primarily about a single axis lying substantially in the plane of movement of the center of said gripping means thereby facilitating the extraction of said plate from said retention members and minimizing the distortion of the peripheral edge of said plate.

2. The dispenser set forth in claim 1 wherein said dispensing arm is spring biased in an upward direction away from the dispensing end of the container, with a manually operated locking pin to maintain said arm in a downward position when not in use.

3. The dispenser set forth in claim 1 wherein said retention members are two L-shaped lugs pivotally attached to the exterior surface of the container at the intersection of the two arms of the retention lug, with one arm extending transversely through an aperture in the container to engage the upper peripheral surface of the uppermost plate, and the other arm extending downwardly away from the dispensing end and abutting the exterior surface of the container whereby upward oscillation of the transversely extending arm is restrained, said transversely extending arm being free to oscillate downwardly out of the path of the entering plates when contacted by plates being inserted into the container, said retention lugs adapted to normally assume the position for retaining the stacked plates within the container.

4. The dispenser set forth in claim 1 wherein said means for engaging the uppermost plate is a vacuum pick-up whereby said plate is grasped on its exposed surface by a downward movement of the dispensing arm, causing said vacuum pick-up to contact the exposed surface of the plate, said plate being held by said vacuum pick-up and lifted free of the retention members by the upward movement of the arm to the dispensing position.

5. The dispenser set forth in claim 4 wherein said vacuum pick-up is a flexible soft rubber suction cup.

6. The dispenser set forth in claim 1 wherein said dispensing end is provided with a raised collar on which

the dispenser rests in a recessed installation, said collar being integral the container end of sufficient height to prevent the flow of liquids from the surface into which the dispenser is recessed to the interior of the container.

7. The dispenser set forth in claim 6 wherein said collar is provided with a sealing gasket on its underside to effect a seal between said collar and the surface into which the dispenser is recessed.

8. A plate dispenser comprising a tubular container, said container being adapted to receive therein a stack of inverted flexible fibre or plastic plates through an upper dispensing end, a removable bottom cover on the container end remote from said dispensing end, a spring actuated plunger disposed within the container between said inserted plates and said bottom cover, said plunger urging the inserted plates towards said dispensing end, a dispensing arm hinged at one end to a bracket attached to the peripheral edge of the dispensing end, said arm having a handle and means for engaging and grasping the uppermost plate at a point slightly beyond the center of the inserted plates as measured from the hinge point, two retention members pivotally attached to the container wall adjacent the dispensing end on a line perpendicular to the dispensing arm at a distance measured from the hinge point which is slightly less than the distance between said hinge point and the center of the inserted plates, said members normally bearing on the upper peripheral surface of the uppermost plate whereby the inserted plates are retained within the container, said members being adapted to automatically retract out of the way when contacted by plates which are being inserted into the container and to remain substantially fixed as said plates are being removed therefrom, and a guide spring attached to the inner wall of the container adjacent the dispensing end to align the uppermost plates in the stack beneath said retention members.

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