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3,435,987

DISPENSING DEVICE WITH ADJUSTABLE RESILIENT OUTLET

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Sheet 2 of 2

FIG. 2

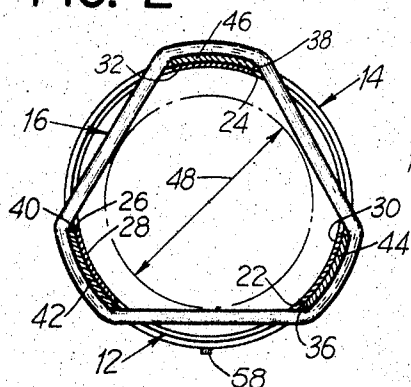
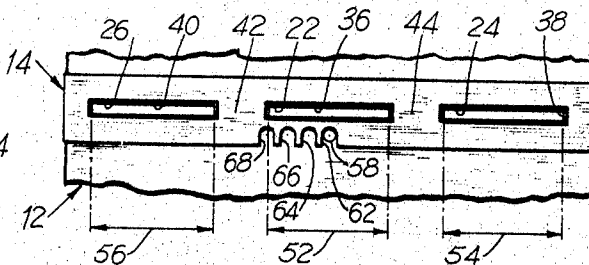


FIG. 3



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DISPENSING DEVICE WITH ADJUSTABLE
RESILIENT OUTLET

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6 Claims

ABSTRACT OF THE DISCLOSURE

A dispensing device comprising a hollow container having at least one wall slot and having an open outlet end; an annular member having a portion overlapping the container slot and forming an opening said annular member being displaceable relative to the container for changing the size of the opening; and a resilient member disposed adjacent the container and adjacent the annular member and received in said opening.

Cross-references

A conventional cup dispenser is shown in U.S. Patent No. 3,006,503, O'Neil.

Background of invention

The present invention relates to a dispensing device for cylindrical or frusto-conical articles and particularly to a dispensing device for cups.

The prior art cup dispenser has an upstanding cylindrical container, open at its lower end, and a resilient annular member mounted on the container lower end to support a stack of cups and to permit removal of one cup at a time. Some problems with the prior art construction include inability to handle a large range of cup sizes, inability to adjust the cup-holding force and difficulty to load cups through the container lower end.

Summary

The above problems are solved in one embodiment of the present invention by using a rigid ring, which surrounds and is angularly displaceable relative to the cylindrical container and which has equi-spaced angularly-spaced slots matching similar slots in the container, and by using a resilient O-ring, which is received in the slots and wrapped over the ring. By angularly displacing the rigid ring, the length of each slot can be adjusted and the inside diameter of the O-ring can be adjusted whereby the cup dispenser can handle a large range of cup sizes, and the cup-holding force can be adjusted, and the cups can be loaded through the container lower end.

Description of drawings

In the following figures, like parts are designated by like numerals.

FIG. 1 is an elevation view of a cup dispenser, embodying features of the invention;

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

FIG. 3 is an exterior, developed, elevation view corresponding to FIG. 2;

FIGS. 4 and 5 are sectional views similar to FIG. 2; and

FIGS. 6 and 7 are respective developed elevation views of FIGS. 4 and 5.

Referring to FIG. 1, one embodiment of the present invention is a cup dispenser 10. Dispenser 10 includes a cylindrical container 12, a rigid ring 14, which is angularly displaceable relative to the container 12, and a resilient O-ring 16.

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The container 12 has a peripheral wall 18 with an outlet end portion 20, which has a plurality of equi-spaced, angularly-spaced slots 22, 24, 26 with respective wall portions 28, 30, 32, disposed between the slots 22, 24, 26.

Rigid ring 14 also has an annular wall 34, having a plurality of equi-spaced angularly-spaced slots 36, 38, 40 which approximately match the container slots 22, 24, 26, and also having respective wall portions 42, 44, 46 disposed between its slots 36, 38, 40.

O-ring 16 has a minimum design diameter 48, as shown in FIG. 2, when slots 22, 24, 26 respectively align with slots 36, 38, 40 and also has a maximum design diameter 50 as shown in FIG. 6, when slots 22, 24, 26 are angularly offset to a full amount from slots 36, 38, 40 as explained hereafter. By angularly displacing rigid ring 14 relative to container 12, its wall portions 42, 44, 46 respectively overlap container slots 22, 24, 26 forming respective adjustable-length, equi-spaced openings 52, 54, 56, which receive the O-ring 16 and which determine the sizes of design diameters 48, 50.

Container 12 also has an adjustable connector 58 for locking rigid ring 14 in place to container 12. Connector 58 is a pin 60, mounted on peripheral wall 18 and extending radially outwardly from peripheral wall 18 for engaging one of a group of angularly-spaced notches 62, 64, 66, 68 in the annular wall 34. In this way, connector 12 angularly positions rigid ring 14 relative to container 12.

Container 12 also has a head portion 70 for supporting a plurality of cups 72, a bottom end wall 74, which is fixedly connected to peripheral wall 18 forming a chamber 76, and a spring means 78, such as a helical spring, disposed between end wall 74 and head 70 in chamber 76.

Helical spring 78, has a selected spring rate, designed to provide a longitudinal force 80 for urging the cups 72 toward outlet end 20 and to be sufficiently compressible for storing a maximum number of cups 72 in chamber 76.

O-ring 16 also has a selected spring rate, designed to provide equal radial forces 82, 84, 86 acting radially inwardly on the uppermost cup 72 to hold the cup in position against the longitudinal force 80 of helical spring 78, and designed to avoid damage to the cups 72 at their sides and edges when loading a plurality of cups 72 into chamber 76 through outlet end 20. Thus, the spring rate of helical spring 78 is a mathematical function of the spring rate of O-ring 16.

While the present invention has been described in a preferred embodiment, it will be obvious to those skilled in the art that various modifications can be made therein within the scope of the invention. It is intended that the appended claims cover all such modifications.

What is claimed:

1. A dispensing device comprising:

a hollow container having at least one wall slot and having an open outlet end;

an annular member having a portion overlapping the container slot and forming an opening, said annular member being displaceable relative to the container for changing the size of the opening; and

a resilient member disposed adjacent the container and adjacent the annular member and received in said opening.

2. The dispenser in claim 1, in which:

said container is an elongate cylinder;

said annular member is a rigid ring surrounding the cylinder and being angularly displaceable relative to the cylinder and having at least one slot disposed adjacent the cylinder slot forming said adjustable-size opening receiving the resilient member; and

said resilient member is an O-ring.

3. The dispenser in claim 2, in which:

said container has an adjustable connector engaging

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rigid ring for locking ring to container after adjustment of ring relative to container.

4. The dispenser in claim 2, including
spring means disposed inside the container, said spring
means having a first end portion bearing against the
container and an opposite end portion displaceable
relative to said first end portion. 5
5. The dispenser in claim 4, in which:
said container has a peripheral wall and an end wall
fixed to peripheral wall forming a chamber for storing
a plurality of cups; and 10
said spring means is a helical compression spring dis-
posed in said chamber between said fixed end wall
and said cups.

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6. The dispenser in claim 5, in which:
said helical spring has a spring rate which is a mathe-
matical function of the spring rate of said resilient
O-ring.

References Cited

UNITED STATES PATENTS

2,232,425 2/1941 Balton ----- 221—307 X

FOREIGN PATENTS

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STANLEY H. TOLLBERG, *Primary Examiner.*