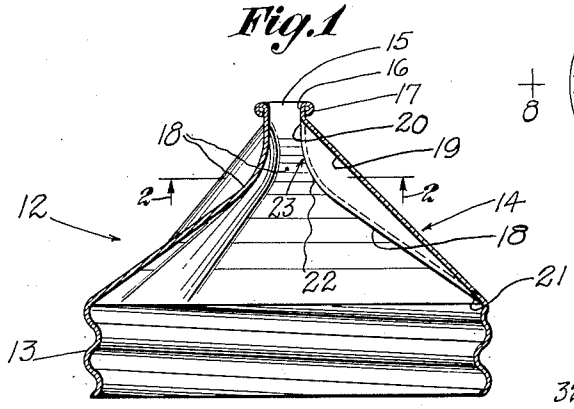
July 16, 1935. L. SCHUMACHER 2,008,564

NONCLOGGING DISPENSER

Filed Feb. 19, 1934

Fig. 1



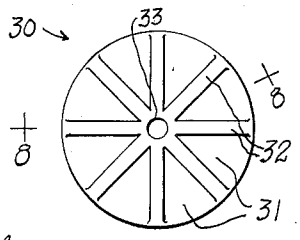


Fig. 7

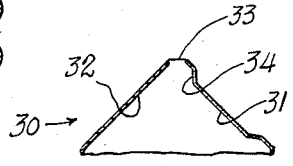


Fig. 8

Fig. 2

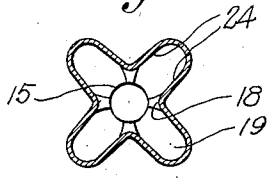


Fig. 6

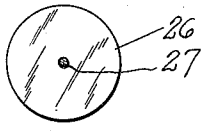


Fig. 3

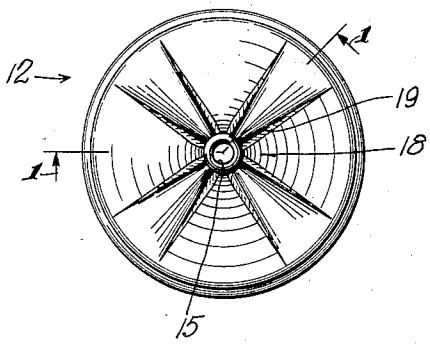


Fig. 5

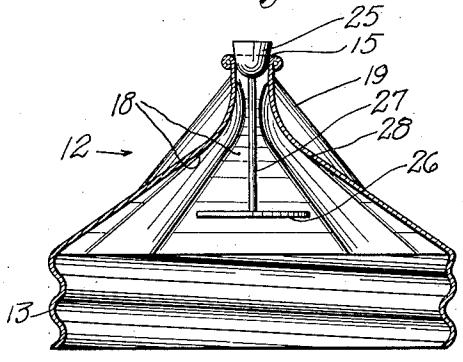
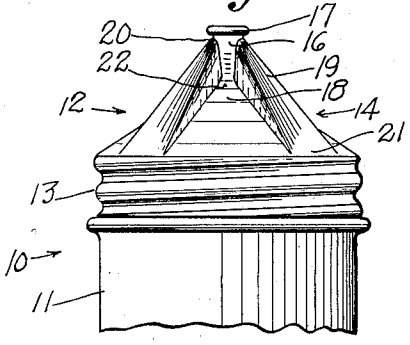


Fig. 4



INVENTOR:

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NONCLOGGING DISPENSER

Louis Schumacher, Brooklyn, N. Y.

Application February 19, 1934, Serial No. 711,853

21 Claims. (Cl. 221—61)

This invention relates to dispensing devices and has particular reference to nonclogging dispenser outlets or spouts for relatively finely divided materials.

One object of the invention is to provide a highly simplified device of the character described having improved means embodied in the wall thereof, for the purpose set forth; and preferably wherein an improved one piece spout may be utilized having few parts, and which is durable, reliable and efficient in use, neat and attractive in external appearance, and desirably adapted to be constructed as a stamping.

Heretofore nonclogging dispensers have utilized screens or screen like elements opposite to the port of the spout for the holding back of caked lumps of the finely divided material from the port to prevent clogging thereof. Such constructions have required proper finishing and mounting of the screens, and in certain cases accurate fitting of the screens into the spout, with consequent increase in cost of manufacture. In external appearance, such devices have all been similar to each other and to standard devices lacking the screen, so much so that it was impossible to tell them apart from each other.

This invention aims to overcome the above mentioned disadvantages and to provide an improved nonclogging dispenser cover for devices such as sugar spills.

Other objects and advantages of the invention will become apparent as the specification proceeds.

With the aforesaid objects in view, the invention consists in the novel combinations and arrangements of parts hereinafter described in their preferred embodiments, pointed out in the subjoined claims, and illustrated in the annexed drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is a vertical cross sectional view taken on the broken line 1—1 of Fig. 3, showing a device embodying the invention.

Fig. 2 is a horizontal cross sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a top plan view of the device.

Fig. 4 is a fragmentary view in side elevation of a device embodying the invention.

Fig. 5 is a view similar to Fig. 1, showing a modification of the invention.

Fig. 6 is a plan view of a stop element.

Fig. 7 is a top plan view of a further modification of the invention.

Fig. 8 is a fragmentary vertical cross sectional view taken on the line 8—8 of Fig. 7.

The advantages of the invention as here outlined are best realized when all of its features and instrumentalities are combined in one and the same structure, but, useful devices may be produced embodying less than the whole.

It will be obvious to those skilled in the art to which the invention appertains, that the same may be incorporated in several different constructions. The accompanying drawing, therefore, is submitted merely as showing the preferred exemplification of the invention.

Generally described, this invention provides a conoidal outlet or spout having an apical port together with channels and ridges angularly spaced and extending in a generally radial direction along the conoidal wall toward the port and so interrelated that finely divided, pulverulent or granulated material is free to flow along the channels or one of them to substantially fully feed the port while holding back caked lumps of the material to prevent clogging the port. The invention, while of general application, may be best understood by reference to a specific well known dispenser such as a sugar spill, which is adapted to be manually grasped and tilted to discharge sugar as desired. The sugar spill may include a container and a cover, which may be of integral or separate construction, preferably the latter. The cover may be of one piece construction, having a conoidal wall and a large annular base connecting flange for the container. The conoidal wall may be generated by an angle of revolution of at least 30 degrees from the axis thereof, and is provided with an apical port. The latter, while preferably circular, may be of any suitable constricted shape, as square, and the same may apply to the wall of the cover. Desirably, the port may be of tubular, that is, elongated form, of constant area, but quite short in length. The ridges are pressed from the conoidal wall so as to extend into the interior of the cover, and to provide open channels or grooves therebetween. Thus, while the cover is made of sheet material such as sheet metal, the ridges merge at their ends into the conoidal wall in spaced relation to the port and to the circular screw flange, if any. More specifically, the ridges terminate outside of a cylindrical surface determined by the port. The grooves may be regarded as having means in proximity to the port for spacing or retaining large caked lumps away from the port; such means may be of various constructions. The simplest arrangement consists in causing the

ridges to have humps in relatively close proximity to the port, as at the points where the ridges terminate in the cylindrical surface of the port. The effectiveness of the ridges and/or humps depends on their depth, and, generally speaking, a depth approximately equal to the diameter of the port may be considered satisfactory, though such depth may be made greater or less, depending on the nature and caking tendency of the material to be dispensed, the desired rapidity of dispensing, the manner of use of the device, and numerous other factors. The capacity of each channel depends on like factors, and is generally intended to be sufficient for a feed of material to the port according to the normal capacity of the latter. This is desirable since relatively few channels can be provided, because the channels desirably have substantially parallel or diverging side walls in cross section, so that the material will not tend to bind or clog therein, and also to facilitate die stamping of the cover. The depth of the ridges and the capacity of the grooves naturally affect each other, and hence the proportions mentioned are intended to be suggestive. In comprehending the scope of the invention, the equivalency of various terms is indicated in this general description.

Referring in detail to the drawing, **10** denotes a device embodying the invention, and including a container **11** and a cover **12** therefor. The latter may have a cylindrical screw flange **13** for detachable connection with the container. Extending upward from the flange as a base is a generally conoidal wall which is relatively shallow or flattened, as much as may be feasible, and being desirably formed by an angle of revolution of not less than 30 degrees. Said conoidal wall may have an apical circular port **15** at the end of a cylindrical tube **16**, which may have a beaded rim **17**.

The cover **12** may be a simple one piece sheet metal stamping, but it can also be molded, cast or pressed of other material. It may have a plurality of angularly spaced radial internal ridges **18** embodied in the wall thereof and forming therebetween the flow channels or grooves **19**. At their ends the ridges terminate in spaced relation to the port **15** and flange **16** and merge into the wall **14** as at **20**, **21**. It is perceived that the ridges are thus closed ended.

Desirably the ridges **18** may have their maximum depth or degree of projection at points such as **22** located wherever abutments or humps are required to retain lumps of caked material from moving against the tube **16** to clog the same or the port **15**. Desirably the ridges may taper or diminish in depth toward the port, so that the ridges may not themselves obstruct the port. More specifically, the ridges terminate or have their free edges at **23** lying in the cylindrical surface determined by the periphery of the port or outside of such surface so as not to obstruct the port. In this regard, it is to be noted that due to the convergence of the conoidal wall, there is relatively limited space available in the region immediately back of the port.

The ridges may also diminish in depth from the abutment sections **22** thereof toward their lower ends **21**, and may increase in width toward said ends, for a purpose hereinafter described.

It is preferred that the individual channels **19** shall have a capacity at least equal to that of the port **15**, approximately. If a greater number of channels are provided, the capacity of the individual channels may be less than that of the port, but in the construction shown, the capacity of each channel is at least equal to and desirably greater than the capacity of the port, bearing in mind that the ridges **18**, however, can be constructed so as not to obstruct the port and yet to retain lumps of caked material away from the port. In fact, these possible variations may be generally expressed by the statement that the capacity of each channel is approximately equal to the capacity of the port. This relationship permits the sugar spill to be tilted in any direction whatever to discharge its contents. Comparison may also be made between the cross sectional area of the port and that of the individual channels at the region **22**, as the latter is the essential critical portion relied upon for operation; and hence the terms area and capacity may be largely interchangeable.

While the depth of the channels or projection of the ridges at **22** may vary considerably, such dimension in the construction shown is approximately equal to the diameter of the port, though it may also be less or greater. Thus the degree of projection from the wall **14** may be greater if the edges **23** lie in spaced relation to the cylindrical surface determined by the port **15**, and in proportion to the extent of such spaced relation.

It will be noted that the opposite side faces **24** of the channels are approximately parallel as shown in Fig. 2, in the sense that their longitudinal openings are full open and not pinched together. If desired, these faces may be parallel throughout, longitudinally as well as transversely.

The ridged arrangement also affords a powerful reenforcement to the cover **12** preventing the same from being completely broken if the sugar spill is dropped, and affords a better hand grip for screwing the cover on and off from the container **11**. Externally, the appearance of the cover is novel and distinctive, whereby the device is readily distinguished from other devices which do not embody this invention.

The manner of use of the sugar spill will now be briefly described. The one piece cover **12** is removed and the container filled with granulated sugar, after which the cover is replaced. The container may then be manually grasped and tilted in any desired direction causing a flow of the sugar into the cover, with the sugar readily spreading into the then lowermost channel or channels **19** at the shallow portions thereof. The sugar then flows along the channel to the port **15** and is discharged. Any large caked lump of sugar will rest on the ridges and will not interfere with the flow through the channel. If the sugar spill is substantially inverted, such large lump will be retained by the humps **22** in spaced relation to the port **15**, so as not to obstruct the same. Very small lumps of caked material may enter the channels, but will be discharged through the port, or else forced out of the channel by the underflow of fine sugar, or dislodged by turning or shaking the dispenser.

An important feature of the invention is that the ridges **18** have their free edges relatively thin at the humps **22**, thereby facilitating the breaking up of large lumps of caked material, especially on shaking the sugar spill.

In Figs. 5 and 6 is shown a modification of the invention including an external valve **25** for the port **15** of the cover **12**. To retain the valve in engagement, an internal stop or disc **26** may be axially connected to the valve as by a rod **27**. When the dispenser is tilted or inverted, the disc **26** may rest on the ridges **18** without interfering

with the flow through the channels 19. If the disc be utilized as an abutment to prevent clogging of the port 15 by lumped material, the ridges and channels may terminate in considerably spaced relation to the port, or, the humps 22 may be moved to a region as at 28, where the disc is adapted to contact and rest thereon.

Figs. 7 and 8 show a further modification of the invention, including a one piece stamped sheet metal sugar spill cover 30 having internal radial angularly spaced ridges 31 forming corresponding grooves or flow channels 32 therebetween adapted to communicate with the port 33. The essential distinguishing characteristic of the device 30 is that the ridges terminate in spaced relation at 34 to the cylindrical surface determined by the port 33, whereby greater accessibility to the port is afforded, and a larger number of the channels may be used. Naturally, the location of the points 34 is affected by the length of the spacing mentioned and by the degree of projection of the ridges or at least of the humps at 34. The flow capacity or area of the individual channels may be less in this modification than in the device 12 and may be approximately equal to that of the port 33. Either the ridges or the grooves or both may be shaped as sectors, preferably the former. An assembly as shown in Fig. 5 may be satisfactorily used in the device 30.

It will be appreciated that various changes and modifications may be made in the device as shown in the drawing, and that the same is submitted in an illustrative and not in a limiting sense, the scope of the invention being defined in the following claims.

I claim:

1. A one piece sheet metal cover for a sugar spill, said cover being of generally shallow conoidal form and having a port at the apex thereof, said cover having a plurality of radial angularly spaced internal flow channels in the wall thereof, said channels forming retaining ridges therebetween and being of a depth approximately equal to the diameter of the port and terminating substantially in a cylindrical surface determined by the periphery of the port, whereby lumps of caked sugar are retained against clogging the port.

2. A sugar spill having a conoidal one piece cover provided with a port at the apex thereof, said cover having a plurality of internal radial angularly spaced flow recesses providing retaining ridges therebetween, said ridges terminating approximately in a cylindrical surface determined by the periphery of said port.

3. In a stamped one piece sugar spill cover, a conoidal wall adapted to be connected to a container and having a port at its apex, said wall having angularly spaced internal flow grooves extending in the general direction of radial lines of said wall, said grooves providing retaining ridges therebetween merging at their ends into said wall, said ridges terminating at points within the wall in spaced relation but in relatively close proximity to said port and being closed ended at said points.

4. A one piece sugar spill cover of thin material, said cover having a wall of relatively shallow conoidal form and having a cylindrical screw flange at the lower edge of said wall, said cover having a port at the apex thereof, said cover having internal ridges angularly spaced with respect to the axis of the cover, said ridges providing flow grooves therebetween, said ridges terminating in spaced relation to said port and said flange and merging into the wall of the cover, whereby the ridges prevent caked lumps of sugar from clogging the port while finely divided sugar freely flows to the port along said grooves, and the flow grooves having sufficient capacity for a full feed of sugar to said port.

5. A sugar spill container adapted to be manually grasped and tilted to discharge pulverulent material, said sugar spill having a container cover having a conoidal wall the base whereof is substantially equal to the diameter of the container and the said wall being formed by an angle of revolution greater than 30 degrees, said cover having a port at the apex thereof, said wall having a plurality of internal ridges angularly spaced about the axis of said cover, said ridges providing flow channels therebetween, the cross sectional area of one of said channels being approximately equal to that of said port, whereby pulverulent material can be supplied to the port through one of said channels.

6. A conoidal sugar spill cover having a port at the apex thereof and having angularly spaced internal ridges providing flow channels therebetween, said channels being in substantial communication with each other internally of the cover at a point spaced from the port, the channels being of substantial depth and the ridges being spaced from the port so as not to obstruct the region at said point.

7. A one piece conoidal sugar spill cover having internal angularly spaced ridges providing flow channels therebetween and having a port at the apex thereof, the depth of the ridges being equal approximately to the diameter of the port, and the ridges having end portions terminating in spaced relation to said port, and constituting an abutment to prevent caked material from clogging the port.

8. A conoidal sugar spill cover having a port at the apex thereof and having angularly spaced ridges providing flow channels therebetween, the depth of said channels increasing toward a point spaced from said port and then diminishing toward said port, and the width of said channels diminishing toward said port.

9. A conoidal sugar spill cover having an apical port and internal angularly spaced ridges providing flow channels therebetween, the channels increasing in depth toward the port and the ridges terminating outside of a cylindrical surface determined by the periphery of the port.

10. A conoidal sugar spill cover having an apical port and having internal angularly spaced radial ridges providing open flow channels therebetween adapted to communicate with the port, the ridges terminating beyond a cylindrical surface determined by the edge of the port and providing humps in proximity to the port to prevent clogging thereof by caked masses of a pulverulent material to be discharged by the sugar spill.

11. A one piece sheet metal sugar spill cover having a wall of relatively shallow conoidal form, said cover having a circular port at the apex thereof and having a therewith alined cylindrical base screw flange for connection to a sugar spill container, said cover having angularly spaced radial internal ridges merging at their ends into said wall at points spaced from said port and said flange, said ridges providing flow channels therebetween and terminating approximately in a cylindrical surface determined by the edge of said port, said channels each successively increasing and then decreasing in depth and diminishing in width toward said port, the area of each

of said channels being approximately equal to the area of said port and the depth of each of said channels being approximately equal to the diameter of said port, said ridges thereby providing humps in proximity to the port to prevent clogging thereof and without obstructing said port against free communication therewith by the flow channels.

12. A one piece sheet metal sugar spill cover having a wall of relatively shallow conoidal form, said cover having a circular port at the apex thereof and having a therewith alined cylindrical base screw flange for connection to a sugar spill container, said cover having angularly spaced radial internal ridges merging at their ends into said wall at points spaced from said port and said flange, said ridges providing flow channels therebetween and terminating in spaced relation to the edge of said port, each of said channels first increasing in depth to a point in proximity to said port and then decreasing in depth substantially up to said port, and each of said channels diminishing in width substantially up to said port, the area of each of said channels being approximately equal to the area of said port and the depth of each of said channels being approximately equal to the diameter of said port, said ridges thereby providing humps in proximity to the port to prevent clogging thereof and without obstructing said port against free communication therewith by the flow channels.

13. A one piece sheet metal sugar spill cover having a wall of relatively shallow conoidal form, said cover having a circular port at the apex thereof and having a therewith alined cylindrical base screw flange for connection to a sugar spill container, said cover having angularly spaced radial internal ridges merging at their ends into said wall at points spaced from said port and said flange, said ridges providing flow channels therebetween and terminating in spaced relation to the edge of said port, the area of each of said channels being approximately equal to the area of said port and the depth of each of said channels being approximately equal to the diameter of said port, said ridges thereby providing humps in proximity to the port to prevent clogging thereof and without obstructing said port against free communication therewith by the flow channels.

14. A conoidal sugar spill cover having a plurality of internal radial angularly spaced ridges providing continuously open flow channels therebetween, said cover having an apical port adapted for communication with said flow channels, the ridges being spaced from the edge of the port so as not to obstruct the same, the depth of each ridge being approximately equal to the diameter of the port and the cross sectional area of each flow channel being approximately equal to that of the said port.

15. A conoidal sugar spill cover having an apical port and internal angularly spaced substantially radial ridges providing flow channels therebetween adapted to communicate with said port, each of said channels having a cross sectional area approximately equal to that of the port, opposite side walls of each channel being approximately parallel to each other, and the ridges being of triangular form in cross section.

16. A relatively continuously shallow conoidal sugar spill cover terminating at its smaller end in a port, the portion of the cover below the port having internal radial groove forming ridges, an external valve for the port, a plate means in the cover connected to the valve to move gravitationally as a unit therewith, said plate means being normally spaced from the ridges and resting thereon in spaced relation to the port in an inverted position of the cover.

17. A device including a sugar spill cover having an internally radially ridged and grooved conoidal wall having an apical port for communication with said grooves, an external valve for the port, said ridges providing humps in relative proximity to but spaced from the port, and a plate in said cover connected to said valve, said valve and plate being movable as a unit, and said plate being adapted to rest on the ridges below the humps and without closing the grooves.

18. A sugar spill having a conoidal wall having a constricted apical port and being provided with internal radial ridges affording open ended flow channels therebetween, said ridges merging at their ends into said wall, at a point in close proximity to said port, and the latter being smooth walled throughout, an external valve for the port, a plate means in said cover connected to said valve, said valve and plate means being movable as a unit, and said plate means being adapted to rest on said ridges in spaced relation to the port and without closing the same.

19. A conoidal sugar spill cover having an apical port and radial angularly spaced internal ridges providing flow channels therebetween, said ridges having humps in proximity to the port and said ridges merging into the wall of said cover substantially at said port.

20. A conoidal sugar spill cover having an apical port and internal radial angularly spaced open flow channels of substantially large capacity for supplying the port with a full flow of pulverulent material, and means within the cover spaced from said port for preventing clogging of the port by caked lumps of said material, and without obstructing the flow through the channels, said means being swingable to lie at different angles to the different channels and to cover different lengths of said channels on tilting the cover, and other means affording a floating pivotal mounting for the first mentioned means, as set forth.

21. A conoidal sugar spill cover having an apical port and internal radial angularly spaced open flow channels of substantially large capacity for supplying the port with a substantially full flow of pulverulent material, and a member within the cover movable along a path in generally coaxial relation to said port from a point spaced from said port so as not to obstruct the same, to a point more remote from said port, said member being gravitationally movable on tilting the cover, said member when at the first point being in close proximity to the portions of the cover intermediate of said channels so as to prevent obstruction of said port by caked lumps of the pulverulent material, without interfering with the flow of pulverulent material through the channels to the grooves, and said member being adapted to operate as an agitator for material and having a marginal edge portion to tend to break up said lumps, as set forth.

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