

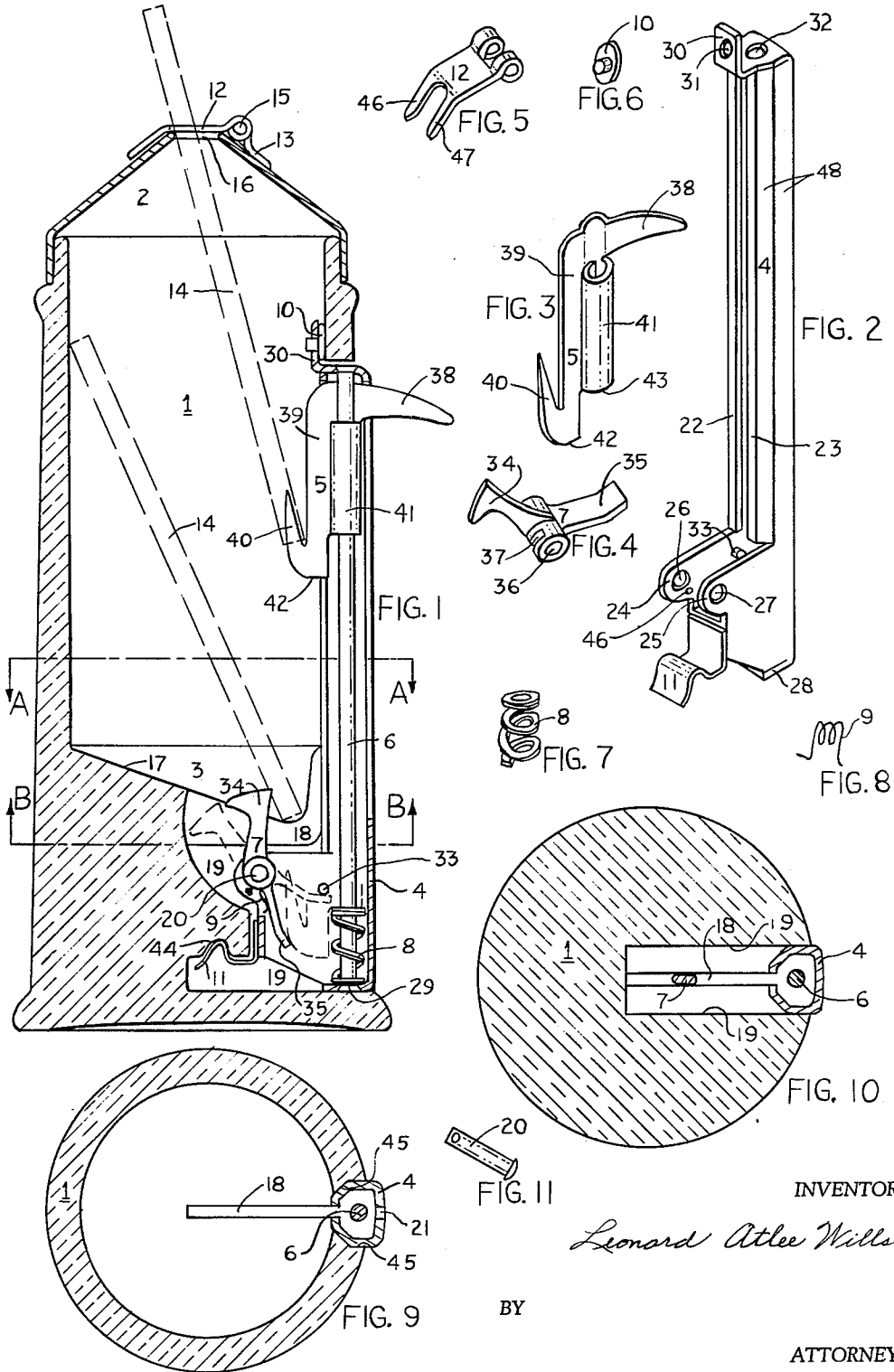
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SANITARY SIPPING-STRAW DISPENSER

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SANITARY SIPPING-STRAW DISPENSER

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This invention relates to straw dispensers, and more particularly to straw dispensers of the type having vertically reciprocable straw ejector means, and wherein straws are supported standing on end within a receptacle, and straw shaking means are provided to facilitate the feeding and proper positioning of straws for ejector engagement and delivery.

A main object of this invention is to provide a novel straw agitator element with unique arrangement and installation with other dispenser elements and which will function effectively to positively and safely agitate and position the bottom ends of straws for reliable ejector engagement.

A further object of the invention is to provide a novel and improved straw dispenser wherein the dispenser elements performing the functions of straw feeding, positioning, and agitation, effectively facilitate straw engagement and ejection while providing a durable, sturdy, inexpensive, and compact assembly which can withstand long and indiscriminate operation and handling without serious damage, wear, or fouling of its operation.

A still further object of the invention is to provide a novel and improved sanitary sipping-straw dispenser which is inexpensive to fabricate, having a relatively simple and sturdy unitized construction, easy to assemble, and which can be operated smoothly, effectively, and conveniently by the users.

Further objects and advantages of the invention will become apparent from the following description and claims and from the accompanying drawings, wherein:

FIGURE 1 represents a vertical central cross-sectional view of the improved sipping-straw dispenser constructed in accordance with the present invention.

FIGURE 2 represents a perspective view of a supporting frame with a clamp spring mounted thereon.

FIGURE 3 represents a perspective view of a straw ejector member.

FIGURE 4 represents a perspective view of a straw agitator member.

FIGURE 5 represents a perspective view of a closure lid—straw retention member.

FIGURE 6 represents a perspective view of a frame support pad.

FIGURE 7 represents a perspective view of an ejector impact absorber spring.

FIGURE 8 represents a perspective view of an agitator torsion spring.

FIGURE 9 represents a horizontal cross-sectional view of the improved straw dispenser, said view being taken substantially on the line A—A of FIGURE 1.

FIGURE 10 represents a horizontal cross-sectional view of the improved straw dispenser, said view being taken substantially on the line B—B of FIGURE 1.

FIGURE 11 represents a perspective view of an agitator pivot pin.

A detailed description is given so that the construction, operation, and features of the invention may be clearly understood:

Referring to the drawing, and more particularly to FIGURE 1, a sipping straw dispenser is designated of the type where straws stand on end in a straw receptacle having a bottom and side walls, a vertically reciprocating straw dispensing mechanism is employed to engage and dispense straws into a straw discharge opening in the

receptacle cover lid, straw positioning cup means, and straw shaking means is employed to perform certain straw agitation functions; the dispenser being of the general type disclosed in U.S. Patent No. Re. 24,950 and U.S. Patent No. 3,113,697, both to Leonard A. Wills.

A cylindrical plastic, glass, or metal jar 1 of proper size and shape is employed for the straw receptacle. The jar 1 is provided with a cover lid 2 which is generally upwardly funnel shaped. Cover lid 2 provided with a straw dispensing aperture at 16. The straw dispensing aperture 16 is provided with a closure and straw retention member 12 (individual view is shown in FIGURE 5) pivotally hinged to bracket 13 by pivot pin 15. Prongs 46 and 47 of closure member 12 increases the closing moment of member 12. The opening between prongs 46 and 47 permits passage of a straw therethrough after member 12 has been rotated to the open position by a straw. The delivered straw is retained in the delivered position by the retention member 12 pressing the straw against the edge of dispensing aperture 16.

Designated at 4 is a supporting frame (individual view is shown in FIGURE 2) comprising essentially a straight vertical portion 43 adapted to house and support an ejector, and means on the bottom portion for supporting a straw agitator member which will be described below. The vertical portion 43 of supporting frame 4 is positioned in opening 45 (as seen in cross-sectional view, FIGURE 9) formed in the vertical side wall of jar 1. Tab 39 formed at the top end of supporting frame 4 fitted with frame support pad 10 (individual view is shown in FIGURE 6) secured thereon at hole 31, contacts the inside surface of jar 1 near the top end of said opening 45 and provides horizontal support for the top end of the supporting frame 4 against outward movement from the jar 1. The bottom end 28 of supporting frame 4 is supported against the bottom surface of cavity 19 formed in the bottom portion of jar 1. Clamp spring 11 attached on supporting frame 4 near the bottom end is received in groove 44 formed in the wall of cavity 19 and secures the bottom portion of supporting frame 4 from outward movement from the jar 1 while also providing a means for ready release for separating the supporting frame 4 from the jar 1.

A straw supporting cup 3 is integrally formed within jar 1 and is adapted to support straws 14 standing on end. Cup 3 is formed with a downwardly funnel shaped concave surface interior bottom wall 17 which generally slopes downwardly toward the side of the cup adjacent the supporting frame 4 and has a narrow slot or opening 18 formed in the lower portion of the concave surface of said bottom wall and also in the side wall of the cup adjacent supporting frame 4. The slot or opening 18 extends from the interior bottom surface of cup 3 into cavity 19 and into the opening 45 in jar 1. The slot 18 underlies the bottom ends of several inclined straws 14 disposed on cup 3 as shown.

A straw agitator member 7 (individual view is shown in FIGURE 4) is pivotally mounted on the lower portion of supporting frame 4 by pivot pin 20 engaging hole 36 in the agitator member 7 and holes 26 and 27 of lugs 24 and 25 respectively formed on the lower portion of supporting frame 4. The agitator member 7 is positioned in cavity 19 of jar 1 and beneath the straw supporting cup 3 of jar 1. A straw contact prong 34 is formed on agitator member 7 and is movable through slot 18 upon rotation of member 7 such that the end portion of prong 34 may contact straws 14 at and near their bottom ends while being supported on cup 3 with their bottom ends standing over a portion of slot 18 and forces the bottom ends of the straws contacted to move slightly to new positions. The straws contacted push against adjacent straws and cause them to move also. A prong 35 is also formed

on agitator member 7 and protrudes essentially inwardly toward the supporting frame 4. A torsion spring 9 (individual view is shown in FIGURE 8) is mounted on pivot pin 20 at notch 37 formed in agitator member 7 and biasing member 7 in a counter-clockwise direction as viewed in FIGURE 1. The agitator member 7 can be of nylon material or other suitable plastic material or metal.

An ejector member 5 (individual view is shown in FIGURE 3) is largely contained within the supporting frame 4 and is slidably mounted on a vertical cylindrical rod 6, the sleeve portion 41 being slidable with rod 6. The top end of rod 6 is supported at hole 32 of frame 4, and the bottom end is supported at joint 29 of tab 28 formed at the bottom end of supporting frame 4. Flange 39 of the ejector member 5 is slidable vertically between inturned flanges 22 and 23 (see FIGURE 2) of the supporting frame 4, and finger lift arm 38 formed on ejector member 5 is slidable vertically in slot 21 (see cross-sectional view of slot 21 in FIGURE 9) formed in the outer vertical side wall of supporting frame 4. Lift arm 38 permits elevation of the ejector member 5 by the user of the dispenser. Straw engagement pin 40 is formed on ejector member 5 and is positioned in vertical registry with slot 18 in cup 3, said pin element 40 being movable vertically through the slot 18 responsive to vertical movement of the ejector member 5, whereby to engage in the bottom end of straw, as will be presently described. A spiral ejector impact absorber spring 8 (individual view is shown in FIGURE 7) is positioned on and near the bottom end of rod 6. The lower end 43 of sleeve 41 of ejector member 5 overlies the impact spring 8 and is contactable with spring 8 at the lowered position. Spring 8 is adapted to absorb shock created by the member 5 impacting thereon. The bottom end 42 of ejector member 5 overlies a portion of arm 35 of agitator member 7 and is contactable therewith on downward movement of the ejector 5 to deliver a force which rotates agitator member clockwise. When the ejector member 5 is elevated, the torsion spring 9 is permitted to rotate the agitator member counter-clockwise.

The operation of the dispenser is described as follows:

Straws 14 are supported on end within the straw receptacle but rest essentially in an inclined position because the funnel shaped bottom wall 17 of the straw supporting cup 3 generally slopes downwardly toward the side of the cup adjacent the frame 4. Being inclined as described, the straws tend to align themselves parallel to each other which facilitates movement of the bottom ends of the straws to the narrow slot 18 for engagement by the straw engagement pin 40. The slot 18 is narrow enough that straws will not fall through. Also, the bottom ends of the straws tend to move closely together, and the openings in their bottom ends are facing essentially in the same direction (perpendicular to the pin) and presenting optimum opening areas for pin engagement. Shaking or agitation of the straws insures that they will not hang up or fail to move over the slot 18 for engagement.

When the finger lift arm 38 is lifted by a user, the engagement pin 40 moves upwardly through the slot 18 and engages the bottom end of a straw. The engaged straw is elevated to a position that permits a portion of the straw to pass through the discharge opening 16 in cover lid 2 for withdrawal by hand. The delivered straw can be retained in the delivered position by the closure—straw retention member 12 passing it against the edge of discharge opening 16, should the lift arm 38 be released before the straw is withdrawn from the receptacle.

When the lift arm 38 is released from an elevated position, the straw engagement pin 40 moves downwardly through slot 18 in cup 3. The bottom end 42 of ejector member 5 contacts arm 35 and rotates the agitator member clockwise (as viewed in FIGURE 1). The straw contact prong 34 of straw agitator member 7 swings through slot 18 such that the upper portion of prong 34 contacts

straws at and near their bottom ends which are standing over the slot. The contacted straws push against adjacent straws causing them also to move slightly to new positions. The result is that the open bottom end of one straw will move over the slot area directly above the engagement pin in proper position for engagement by the ejector pin during its next upward movement. Often when the ejector pin 40 moves downward between the straws and through slot 18, the straws fail to move back over the slot 18, and in such cases the ejector pin 40 on its next upward movement will not engage a straw; therefore, straw agitation is necessary to get the straws to move back over the slot engagement area. The downward movement of the ejector member 5 is arrested by the bottom end 43 of sleeve 41 contacting spring 8 and the spring absorbing any impact shock present.

The above described cycle is now ready to be repeated for the delivery of another straw. Regular, jumbo, or other size straws can be dispensed with the dispenser. The ejector member 5 of course normally rests at the lowered position. It is shown in the elevated position in FIGURE 1 to permit more detail of the assembly to be shown on the drawing.

The unitized assembly comprising the supporting frame 4, straw agitator member 7, ejector member 5, rod 6, impact absorber spring 8, clamp spring 11, torsion spring 9, and support pad 10, is removable from the jar 1 as a straw dispenser attachment. The attachment is removed from jar 1 by pulling outwardly on the bottom portion of supporting frame 4 which disengages clamp spring 11 from groove 44 formed in jar 1. The attachment is then lowered slightly to allow tab 30 to become disengaged at the top end from slot 45 in jar 1. The attachment is replaced in jar 1 in the reverse order of the procedure described.

Some old straw dispenser elements, plus some dispenser features disclosed in my copending application Serial No. 322,183, filing date November 7, 1963, entitled "Sanitary Sipping-Straw Dispenser", together with the novel dispenser elements and features of this invention, are utilized in the straw dispenser embodiment described in this specification and shown in the drawing. The invention covered by this application pertains primarily to the novel straw agitator element, its configuration, its arrangement with the straw receptacle, straw supporting cup means, straw engagement and ejector means, as well as its functioning and actuation. In general, the primary difference between this invention and that disclosed by my above mentioned copending application is that a prong of the straw agitator means (with novel mounting and installation arrangements) is projected against straws at and near their bottom ends to cause their bottom ends to move slightly to new positions, and also the contacted straws push against adjacent straws causing their bottom ends to move slightly on the supporting cup. The agitator member is located near the locality where straws position for engagement by the ejector engagement pin, and the straws caused to move because of the agitator operation are those straws having their bottom ends positioned near the point where straws are engaged. The agitator member of my copending application concerns the contacting and shaking of straws near the point of straw engagement also, but the straw contact means is adapted to permit straws to funnel onto the agitator contact member; whereas, in this invention the agitator contact prong is projected against the straws, or, in other words, the straws are prodded by the agitator contact means.

Advantages of the novel straw agitator element:

As it is the nature of straws to fail to slide occasionally when supported vertically on a funnel-shaped smooth surface under static forces of their own weights, and as they tend to hang together, cross over each other, and stand each other away from the straw engagement area, agitation is often necessary to get them moving again. Paper straws have fuzz on their ends as seen when viewed closely

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which inhibits their movements. They are relatively soft and relatively easily bent or crushed; therefore, these characteristics must be taken into consideration when dispensing same. Agitation of straws prior to each engagement attempt is often necessary to insure that they are in proper positions before each ejector elevation. Often after the engagement pin portion of the ejector moves downward between the straws, and through the engagement slot to the lowered position, the straws pushed aside fail to move back over the engagement slot area in position for engagement, and leave a vacant space directly above the engagement pin. When the ejector is elevated, the engagement pin therefore does not engage a straw. This is remedied by the agitator prong kicking the straws that are adjacent to the engagement area at and near their bottom ends. This straw agitation together with the facilitation afforded by the configuration of the straw supporting (positioning) cup causes a straw to move over the pin engagement area in position for engagement. Straw agitation is localized to those straws essentially in and near the engagement slot area. Obviously there is no need to agitate the other straws in the receptacle because their movement over the engagement slot area is blocked by those straws closer to the slot. Only one straw can position over the area of pin engagement at each ejector operation. The straw agitation is done in a *positive* manner, by the agitator contact member actually striking the straws and causing them to move against other straws, urging their bottom ends to move over the engagement pin area, but is done in a manner that does not harm the straws as they are freely supported on the cup and free to move. Lowering of the ejector slowly which eliminates impact against the agitator actuation arm does not circumvent straw agitation because of this positive straw agitation feature. The agitation member is still rotated, and straws are physically moved by contact therewith. The agitation occurs after the engagement pin has passed downwardly through the slot and before each straw engagement attempt.

The straw agitator element can be relatively small in size and light of weight and still perform its function properly, and is located adjacent the ejector and at the straw engagement area, making a very compact straw agitation means arrangement. This avoids having to actuate a relatively large and heavy member such as when the entire straw supporting cup is shaken for straw agitation. The wear and tear on the device by large moving parts is avoided, and adequate means is provided at less cost. The straw agitation means described permits the use of fixed straw supporting (positioning) cup means, making a more sturdy and durable assembly, and avoids the possibility of a straw being wedged between the interior receptacle sidewall and a moving cup which fouls the operation of the device as the cup cannot be shaken properly to agitate the straws. The agitator straw contact prong in entering the straw receptacle utilizes the same narrow slot (except the slot is made slightly longer), over which straws position for engagement and through which the ejector engagement pin means are movable for straw engagement, eliminating obstructions within the supporting cup which most likely would be needed to provide this facility by other means.

The straw agitator actuation arrangement permits the utilization of a simple drop type of ejector (the user lets

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the ejector member fall from the elevated position to the lowered position) which does not require the use of ejector return springs or more complicated types of ejector actuating means.

This type of straw agitation permits the use of a molded straw receptacle having the straw supporting cup means integrally molded therewith and possessing necessary means to accommodate straw positioning and agitator actuation, while also permitting the straw ejector-actuation attachment to be readily removed from the receptacle.

While a certain specific embodiment of straw dispenser has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A straw dispenser comprising a receptacle having a dispensing aperture and bottom and side walls, the bottom wall being adapted to support the bottom ends of straws, a straw ejector, a straw agitator, said bottom wall having a concave surface therein and an opening in the concave surface for the passage of said ejector and said agitator, means for mounting said ejector on said receptacle for vertical reciprocation from a lower position to an upper position and during movement from the lower position to pass through the ejector opening, said agitator having first and second portions and being movably mounted on said receptacle and positioned so that said first portion is movable through the agitator opening and adapted to contact the lower portion of the straws to agitate the same, said ejector and said agitator being positioned with respect to each other so that when said ejector moves from its upper position to its lower position said ejector actuates the second portion of said agitator and causes the first portion to move into the agitator opening to agitate the straws to permit a straw to move over the ejector opening and into the path of said ejector whereby the raising of said ejector through the ejector opening may elevate a straw into said dispensing aperture.

2. A straw dispenser as set forth in claim 1 further characterized in that the ejector and agitator opening is in the form of a single narrow slot.

3. A straw dispenser as set forth in claim 2 wherein said agitator is pivotally mounted on said receptacle below said narrow slot.

4. A straw dispenser as set forth in claim 1 further characterized in that said agitator is pivotally mounted on said receptacle below the agitator opening.

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