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(54) **Cleaner for filler nozzles.**

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Description

This invention relates to a cleaner for filler nozzles, and more particularly to such a cleaner which removes excess product from the filler nozzles during operation of the filler.

A filler places product, such as food stuffs, into containers, which are then sealed by lids. Contamination of the sealing area by product falling onto, or otherwise contacting, this area will render the seal between the lid and the container ineffective, and hence, the resulting package unuseable. It is important, therefore, to maintain the seal area of the container free from contamination.

GB-A-2 002 331 discloses a nozzle-wiper assembly for an apparatus for filling containers with liquid. This apparatus comprises a tubular nozzle having slidably mounted thereon a ring member which has at least one passage. So the central opening of the ring member can be subjected to sub-atmospheric pressure to suck off any liquid adhering to the outer surface of the nozzle tube as the tube and the ring member slide relative to each other.

The present invention provides a means which maintains the seal area of containers free from contamination, which controls both solid and liquid and thus is especially useful with piston-type fillers, which may be quickly and easily removed from the filler for cleaning and then just as quickly and easily replaced, which is reliable and which is relatively economical to manufacture and maintain.

Those and other advantages of the present invention will become more readily apparent from a perusal of the following detailed description of a preferred embodiment and the accompanying drawing, wherein:

- Fig. 1 is a horizontal section representation of a piston-type filler incorporating the present invention;
- Fig. 2 is a sectional view taken on line 2-2 of Fig. 1;
- Fig. 3 is a sectional view taken on line 3-3 of Fig. 2; and
- Figure 4 is an expanded view of the structure shown in Figures 2 and 3.

Referring now to Figure 1, there is shown a piston filler, indicated generally at 10, which may be a C-series M&S piston filler, for example. The filler 10 typically has a plurality of pistons reciprocable in cylinders 12 equiangularly positioned around the periphery thereof. The pistons are moved upward as the filler 10 is rotated about its vertical axis 14 to fill the cylinders 12 with product which is then discharged through a nozzle 16, shown in Figures 2 and 3, formed at the lower end of each cylinder. A chain 18 engages a gear 20 attached to the filler 10 and carries containers 22

past the filler. The chain and gear cooperate to position each container 22 under a cylinder 12 so that product discharged from the associated nozzle 16 is received by the container.

A plurality of arcuate vacuum seal blocks 24 are arranged around the periphery of the filler 10 to form an upper vacuum seal 26. Each block 24 extends between two adjacent cylinders 12 and is formed with a semicircular notch 28 at each end to engage the cylinders. Each block 24 is secured in place by four set screws 30, 32, 34 and 36 which extend through threaded holes 38 in the block and engage an annular groove 40 formed in the lower end of the cylinders 12. The circumferential ends of each block abut the adjacent ends of the blocks on each side thereof and completely encircle the cylinders 12 to form the circular upper vacuum seal 26. A circumferential groove 42 is formed in the lower surface of each block 24 to provide clearance for the lower end of the nozzle 16.

A seal plate 44 is secured to a manifold 46 by a plurality of bolts 48. The manifold 46 is supported on a stationery shelf 50 attached to a non-rotating portion of the filler. The shelf 50 has a pair of T-shaped lugs 52 and 54 attached to its upper surface. The lugs 52 and 54 mate with a pair of complementary T-shaped grooves 56 and 58 formed in the manifold 46. The manifold 46, and the attached seal plate 44, can be positioned with the grooves 56 and 58 aligned with the lugs 52 and 54 and then pushed toward the filler 10 until the manifold 46 contacts plates 60 attached at the inner edge of the shelf 50 and the lugs 52 and 54. The plates 60 position the seal plate 44 radially so that it is under the upper seal 26. The manifold 46 is held in this position by a pair of lock bars 62 affixed to the end of a headed lock rods 64. The rods 64 extend through holes 66 of a diameter smaller than the head but larger than the rod itself in the manifold 46. Turning the rod 64 so that the lock bar 62 is behind the shelf 50 will secure the manifold 46 and the seal plate 44 to the shelf 50. The manifold 46 and seal plate 44 can be readily removed for cleaning by simply turning the rods 64 to position the lock bar 62 to clear the shelf 50, as shown in Figure 3 and 4.

The manifold 46 has a central cavity 70 which communicates with a vacuum tube 72, which is connected at its outer end with a vacuum source. The tube 72 is seated in a blind cylindrical hole 74 extending through the outer side of the manifold 46 and across the cavity 70 with its centerline positioned substantially in the plane of the lower surface of cavity 70. The tube 72 has a slot 76 extending transverse to the centerline of the tube and a width substantially equal to the width of the cavity 70. The bottom of the slot 76 is level with the bottom of the cavity 70 so that any material

entering the cavity may be drawn into the tube 72 through the slot 76. The hole 74 extends partially through the inner wall of the manifold 46 and provides a seat, and thus stability, for the tube 72.

The seal plate 44 is sealed to the manifold 46 by the bolts 48 and has arcuate extensions 82 and 84 on each end which extend under the upper seal 26 and form a flow chamber 85 with the grooves 42. A pair of holes 86 and 88 in the seal plate 44 are positioned to provide communication with each end of the cavity 70 in the manifold 46 and the flow chamber 85. The free end of the extension 82 is beveled at 90 to direct air flow, as a result of the vacuum, upward into the chamber 85, and is positioned to be adjacent the exit of the chain 18 from the filler 10. Thus, any liquid dripping from the nozzle 16 that has just filled a container would be sucked into the chamber 85 by the air flow. Also, any solid particles clinging to the nozzle or strings trailing therefrom will be drawn into the chamber 85. Any drips of liquid or solid material falling from the nozzle 16 after it has passed the manifold 46 will be caught by the extension 84. The air flow relative to the nozzle 16 increases over the extension 84 because the velocity of the air flow is added to the velocity of the nozzle due to rotation of the filler. The cleaning action is, therefore, efficient and minimizes the possibility of material being dropped onto the sealing lip of a container during its entrance to the filler. The entire manifold 46 and seal plate 44 may be removed quickly and easily for cleaning. The manifold 46, and blocks 24 are preferable made from a polyethylene material, such as ultra high molecular weight polyethylene and the seal plate 44 from stainless steel, which materials are suitable for use with food stuffs.

Claims

1. A cleaner for a filler (10) having a plurality of cylinders (12) arranged in a circle and rotatable as a unit about the center (14) thereof, each cylinder having a nozzle (16) at its lower end for depositing product into a container conveyed therewith during a portion of each rotation of said filler; characterized by said cleaner comprising:
 - a vacuum manifold (46) having a cavity (70) mounted on said filler and fixed against rotation;
 - means (72) connecting said cavity to a vacuum source;
 - a seal plate (44) attached to the top of said manifold;
 - an upper seal means (24, 26) encircling all of said cylinders and rotatable therewith;
 - a circumferential groove (42) formed in the seal means (24); and

said nozzles (16) being positioned in said groove (42) whereby said vacuum source draws air past said nozzles to cause product on said nozzles to be swept into said cavity.

2. The invention according to claim 1, and further comprising:
 - a shelf (50) affixed to said filler (10);
 - a pair of lugs (52, 54) on said shelf (50);
 - said manifold (46) having slots (56, 58) complementary to and engageable with said lugs (52, 54);
 - a plate (60) at the end of each lug (52, 54) to position said manifold (46) radially of said filler (10); and
 - means (62, 64) securing said manifold (46) against said plates.
3. The invention according to claim 1, wherein said upper seal is formed by a plurality of seal blocks (24);
 - each seal block (24) extending between and engaging adjacent ones of said cylinders (12).
4. The invention according to claim 1, wherein said seal plate (44) includes an extension (82, 84) on each end; and
 - each extension (82, 84) extends radially beyond said manifold (46).
5. The invention according to claim 4, wherein the free ends of said extension includes an angled portion (90) to direct air flow upward into said flow chamber (85).
6. The invention according to claim 5 and further comprising:
 - a shelf (50) affixed to said filler (10);
 - a pair of lugs (52, 54) affixed to said shelf (50);
 - said manifold (46) having slots (56, 58) complementary to and engageable with said lugs (52, 54);
 - limit means (60) on said shelf (50) to radially position said manifold (46); and
 - quick release means (62, 64) for securing said manifold (46) to said shelf (50).

Patentansprüche

1. Eine Reinigungsvorrichtung für eine Füllvorrichtung (10), die eine Vielzahl von Zylindern (12) mit Düsen (16) hat, angeordnet zur Rotation,
 - gekennzeichnet durch**
 - eine obere Dichtung (26) rund um die Füllvorrichtung (10), die mit den Zylindern (12) rotiert,
 - einen Vakuum-Verteiler (26) mit einer Ausnehmung (70), der auf der Füllvorrichtung (10)

montiert ist und gegen Rotation befestigt ist; und
eine Dichtplatte (44), die am oberen Teil des Verteilers (46) angebracht ist und mit der oberen Dichtung (26) eine Fließkammer (85) bildet; wobei
die Düsen (16) in der Fließkammer (85) positioniert sind, und
die Dichtplatte (44) wenigstens eine Öffnung (86, 88) hat, die eine Verbindung zwischen der Fließkammer (85) und der Ausnehmung (70) erlaubt.

2. Reinigungsvorrichtung nach Anspruch 1, gekennzeichnet durch
eine Sockelplatte (50), die an der Füllvorrichtung (10) befestigt ist;
ein Paar von Ansätzen (52, 54) auf der Sockelplatte (50); wobei
der Verteiler (46) Schlitz (56, 58) hat, die mit den Ansätzen (52, 54) komplementär und in Eingriff bringbar sind;
eine Platte (60) am Ende eines jeden Ansatzes (52, 54), um den Verteiler (46) radial zu der Füllvorrichtung (10) zu positionieren; und
eine Einrichtung (62, 64), die den Verteiler (46) gegen die Platten sichert.
3. Reinigungsvorrichtung nach Anspruch 1, bei dem
die obere Dichtung durch eine Vielzahl von Dichtblöcken (24) gebildet ist; und
jeder Dichtblock (24) sich zwischen zwei benachbarten Zylindern (12) erstreckt und diese umfaßt.
4. Reinigungsvorrichtung nach Anspruch 1, bei dem
die Dichtplatte (44) auf beiden Endseiten einen Überstand (82, 84) einschließt; und
jeder Überstand (82, 84) sich radial über den Verteiler (46) hinaus erstreckt.
5. Reinigungsvorrichtung gemäß Anspruch 4, bei dem
die freien Enden der Verlängerung einen angewinkelten Abschnitt (90) einschließen, um einen Luftstrom nach oben in die Fließkammer (85) zu leiten.
6. Reinigungsvorrichtung gemäß Anspruch 5, gekennzeichnet durch:
eine Sockelplatte (50), befestigt an der Füllvorrichtung (10);
ein Paar von Ansätzen (52, 54), befestigt an der Sockelplatte (50); wobei
der Verteiler (46) Nuten (56, 58) hat, die zu den Ansätzen (52, 54) komplementär und mit

diesen in einen Griff bringbar sind;
Begrenzungsmittel (60) auf der Sockelplatte (50) zur radialen Positionierung des Verteilers (46); und
Schnell-Freigabeeinrichtung (62, 64) zur Sicherung des Verteilers (46) gegen die Sockelplatte (50).

Revendications

1. Dispositif de nettoyage pour une machine de remplissage (10) présentant une pluralité de cylindres (12) avec des ajutages (16) disposés pour être entraînés en rotation
caractérisé
par un organe d'étanchéité supérieure (26) encerclant ladite machine de remplissage (10) et tournant avec lesdits cylindres (12),
un collecteur sous vide (46) présentant une cavité (70) monté sur ladite machine de remplissage (10) et fixé pour ne pas être entraîné en rotation;
une plaque d'étanchéité (44) fixée à la partie supérieure dudit collecteur (46) et formant, avec ledit organe d'étanchéité supérieur (26), une chambre d'écoulement (85);
lesdits ajutages (16) se trouvant dans ladite chambre d'écoulement (85); et
ladite plaque d'étanchéité (44) présentant au moins une ouverture (86, 88) permettant la communication entre ladite chambre d'écoulement (85) et ladite cavité (70).
2. Invention selon la revendication 1, comportant en outre :
une tablette (50) fixée à ladite machine de remplissage (10);
une paire de tenons (52, 54) sur ladite tablette (50);
ledit collecteur (46) présentant des mortaises (56, 58) complémentaires auxdits tenons (52, 54) et venant en prise avec eux;
une plaquette (60) à l'extrémité de chaque tenon (52, 54) pour positionner ledit collecteur (46) dans le sens radial de ladite machine de remplissage (10); et
des moyens (62, 64) bloquant ledit collecteur (46) contre lesdites plaques.
3. Invention selon la revendication 1, dans laquelle ledit organe d'étanchéité supérieur est formé par une pluralité de blocs d'étanchéité (24);
chaque bloc d'étanchéité (24) s'étendant entre ceux desdits cylindres (12) qui sont adjacents et venant en prise avec eux.
4. Invention selon la revendication 1, dans laquelle ladite plaque d'étanchéité (44) présente un

prolongement (82, 84) à chaque extrémité; et
dans laquelle chaque prolongement (82, 84) s'étend, dans le sens radial, au-delà dudit collecteur (46).

- 5
5. Invention selon la revendication 4, dans laquelle les extrémités libres dudit prolongement présentent une portion en chanfrein (90) pour diriger le flux d'air vers le haut dans ladite chambre d'écoulement (85). 10
6. Invention selon la revendication 5 et comportant en outre:
- une tablette (50) fixée à ladite machine de remplissage (10); 15
 - une paire de tenons (52, 54) sur ladite tablette (50);
 - ledit collecteur (46) présentant des mortaises (56, 58) complémentaires auxdits tenons (52, 54) et venant en prise avec eux; 20
 - des moyens de limitation (60) sur ladite tablette (50) pour positionner, dans le sens radial, ledit collecteur (46); et
 - des moyens (62, 64) à déblocage rapide pour bloquer ledit collecteur (46) sur ladite 25
- 30
- 35
- 40
- 45
- 50
- 55

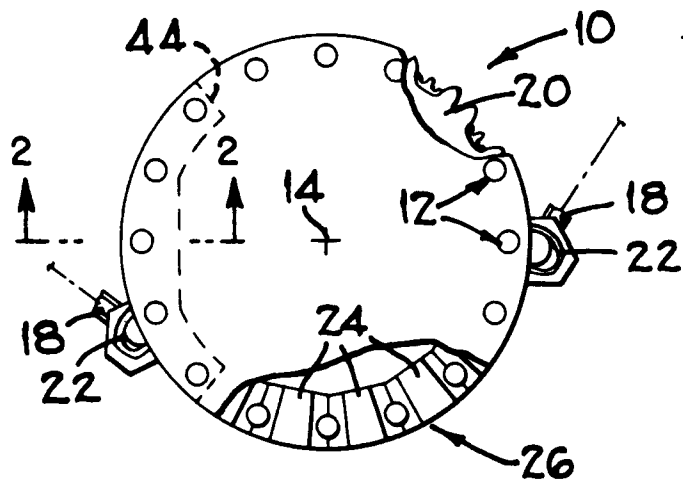


FIG. 1

FIG. 2

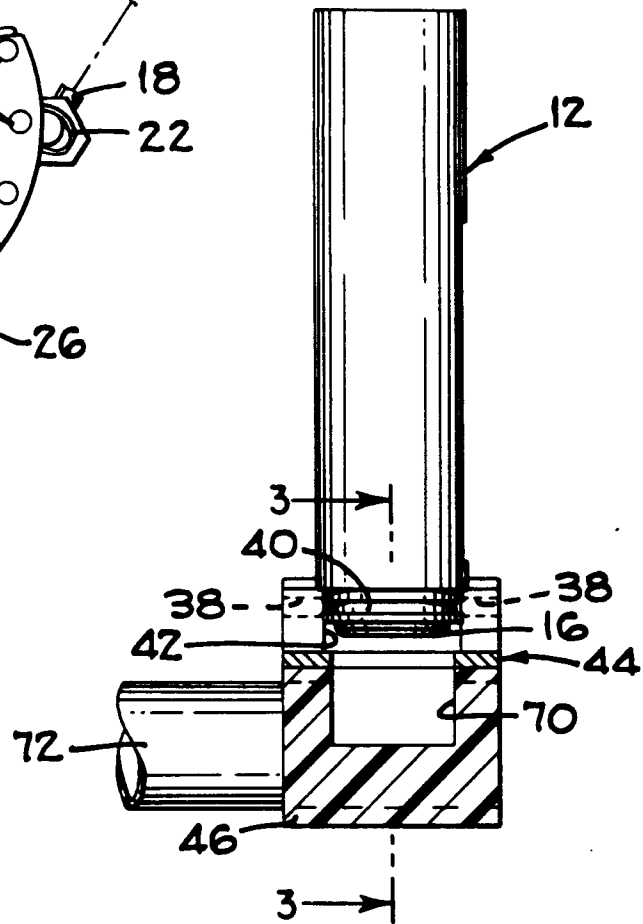


FIG. 3

