

Technical News

Bulletin

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Pocket Air Finger System



U.S. PATENT #5,527,372

U.S. PATENT #5,733,354

1. Product Description

Emhart's patented Pocket Air Fingers precisely control high-speed sweep-out while reducing ware-handling defects. The Pocket Air Finger system stabilizes hot glass containers while the upper pusher cylinder moves them from the deadplate to the conveyor. The Pocket Air Jets hold the containers in the pockets while minimizing the mechanical contact with hot containers. Emhart's Pocket Air Fingers have been designed with flexible and quick configuration in mind. Emhart's Pusher Fingers are offered in a wide variety of finger configurations. Each type of Pusher finger mounts to the Pusher head in the same manner. This makes job changes quick and easy. The Pocket Air Finger System yields the most benefits to high-speed, high volume, tall container production. This is where the reductions in ware defects (down and stuck ware) result in the largest savings. Most container production applications can justify using Pocket Air Fingers to improve their ware handling process. The Pocket Air Finger assemblies for double and triple gob applications can be easily connected to 317 and 560 upper pusher cylinders. This means that Pocket Air Fingers can readily be added to 317, 560, or 860 Pushers.



Pocket Air Finger assembly on an Emhart 860 Pusher System.



Closeup of Pocket Air Finger on a double gob installation. Note the inward facing air vents in the lower right corner of each finger.



A Pocket Air Finger assembly on a pusher in a triple gob application.

2. Principle of Operation

Once containers are deposited on the deadplate the upper pusher cylinder is extended. When the upper cylinder is fully extended Pocket Air Jets can be turned on. The Pocket Air Jets direct air behind the container creating a vacuum. The vacuum pulls the container into the finger's pocket and holds it there while the containers are transferred to the conveyor belt. Just before the upper pusher cylinder is retracted the pocket air is turned off to release the containers on to the conveyor belt.

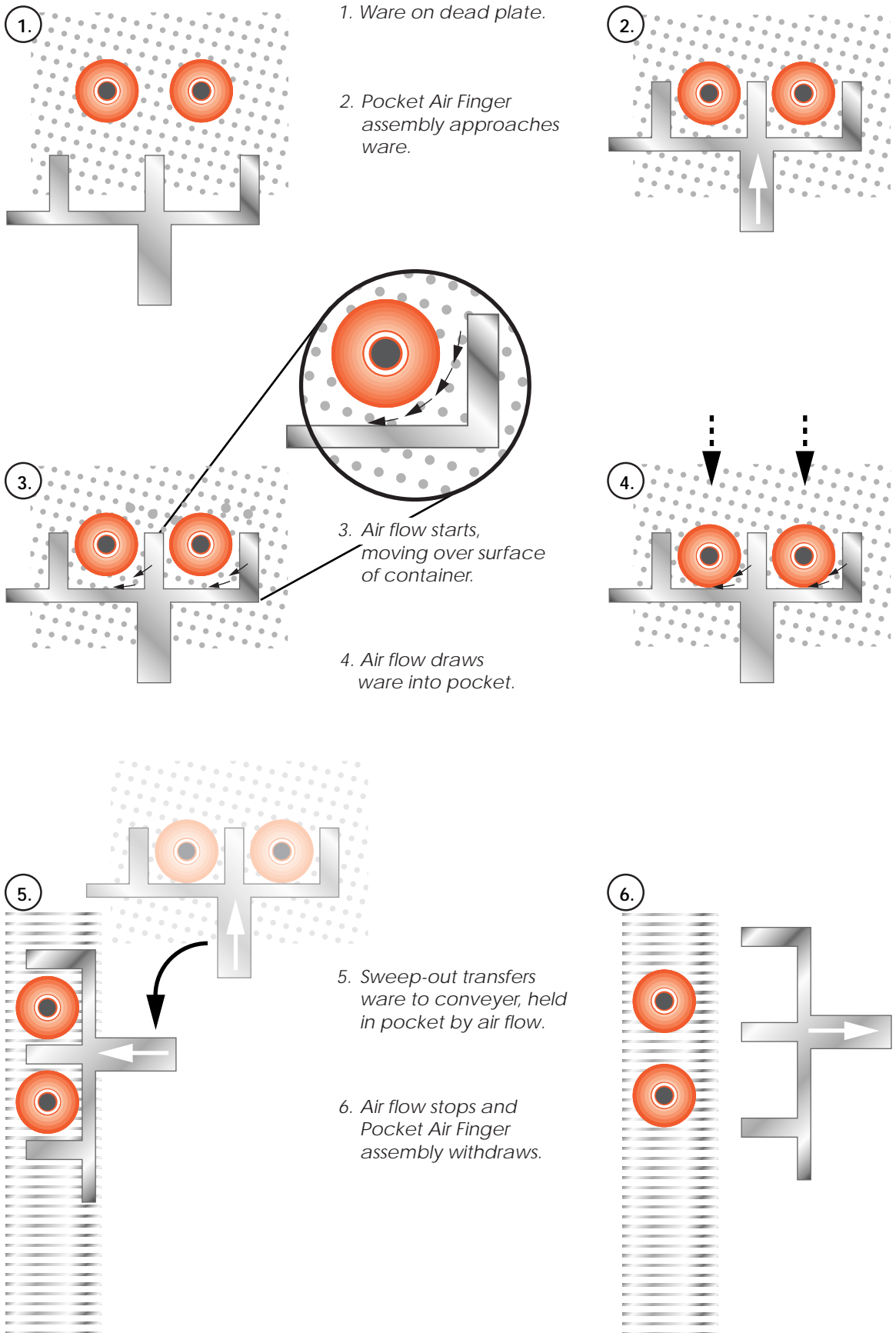
(See illustration "Operation of Pocket Air Fingers").

3. Sizing and Selection

Specify a Pocket Air Finger assembly number by using the chart on page 4. Optimal performance will be achieved by selecting a model which is as close as possible to the maximum ware size. This reduces the inertial forces which produce defective ware.

The 560-series Pocket Air Fingers are for use on all new I.S. machines. 317-series are designed for retrofits on equipment already installed.

4. Operation of Pocket Air Fingers



5. Sizing and Selection (Continued)

The most commonly used assemblies are indicated in the white rows on the chart. These sizes are typically used for high-speed production of soda and beer bottles.

Cost/benefit analysis shows that even on existing pusher units the retrofit of a Pocket Air Fingers assembly is highly recommended.

Maximum Ware Size (mm)	Mold Spacing	Belt Advance	Finger Spacing	Assembly No.	(RH)	(LH)
560: EF 4-1/4 & 5-1/2, F 6-1/4 and AIS						
2-7/8"	4-1/4" DG	7-7/8"	3-15/16"	560-D-92-	01	02
3-1/4" (83)	4-1/4" DG	10-1/2"	5-1/4"	560-D-70-	01	02
2-3/8" (60)	5" DG	7"	3-1/2"	560-D-108-	01	02
3-1/4" (83)	5" DG	8-3/4"	4-3/8"	560-D-103-	01	02
3-1/4" (83)	5" DG	10-1/2"	5-1/4"	560-D-106-	01	02
4" (102)	5" DG	10-1/2"	5-1/4"	560-D-73-	01	02
4-1/4" (108)	5-1/2" DG	10-1/2"	5-1/4"	560-D-74-	01	02
4-7/16" (113)	6-1/4 DG	10-1/2"	5-1/4"	560-D-75-	01	02
5" (127)	6-1/4 DG	13-1/8"	6-9/16"	560-D-76-	01	02
1-3/8" (35)	3"TG	10-1/2"	3-1/2"	560-D-68-	01	02
1-3/8" (35)**	3"TG	10-1/2"	3-1/2"	560-D-104-	01	02
1-3/4" (45)	3"TG	10-1/2"	3-1/4"	560-D-97-	01	02
2" (51)	3"TG	9"	3"	560-D-98-	01	02
2-5/8" (67)	4-1/4" TG	11-13/16"	3-7/8"	560-D-71-	01	02
3" (76)	4-1/4" TG	13-1/8"	4-3/8"	560-D-72-	01	02
317: E 4-1/4 with 117-D-1						
3-1/4" (83)	4-1/4" DG	10-1/2"	5-1/4"	317-D-243-	GR.1	GR.2
317: EF 4-1/4 & 5-1/2, F 6-1/4 and AIS						
3-1/4" (83)	4-1/4" DG	10-1/2"	5-1/4"	317-D-238-	GR.1	GR.2
3-1/4" (83)	5" DG	8-3/4"	4-3/8"	317-D-245-	GR.1	GR.2
4" (102)	5" DG	10-1/2"	5-1/4"	317-D-240-	GR.1	GR.2
4-1/4" (108)	5-1/2" DG	10-1/2"	5-1/4"	317-D-241-	GR.1	GR.2
4-7/16" (113)	6-1/4" DG	10-1/2"	5-1/4"	317-D-235-	GR.1	GR.2
5" (127)	6-1/4" DG	13-1/8"	6-9/16"	317-D-237-	GR.1	GR.2
1-3/8" (35)	3" TG	10-1/2"	3-1/2"	317-D-239-	GR.1	GR.2
2-5/8" (67)	4-1/4" TG	11-13/16"	3-7/8"	317-D-234-	GR.1	GR.2
2-5/8" (67)**	4-1/4" TG	11-13/16"	3-7/8"	317-D-244-	GR.1	GR.2
3" (76)	4-1/4" TG	13-1/8"	4-3/8"	317-D-236-	GR.1	GR.2

** Most Pocket Air Fingers are 2-9/16" in height

Assemblies 560-D-104 and 317-D-244 are 1-1/2" high

6. Benefits of Pocket Air Fingers

- **Pocket air holds containers between the fingers during sweep-out.**
 - Glass containers can be manufactured at an increased production rate
 - Pushers can cycle at 20 (+) cycles/min.
 - Machine conveyor belt speeds can be > 1m/sec.
 - Significantly reduces down and stuck containers
 - Up to 80% reduction (from 5% to less than 1%)
 - Consistently a higher percent packed
 - Precise placement of containers permits closer spacing of the containers
 - Closely spaced containers permit high-speed production at normal ware handling and conveyor speeds
- **Pocket Air Fingers are designed for flexibility and quick configuration**
 - A single finger assembly can be used for a variety of containers
 - Round and non-round containers
 - Each assembly is useful for a range of container types and sizes
 - Fingers mount to standard upper pusher cylinders
 - Existing equipment requires only minor changes
 - Only 30 minutes down time per section (Install during job change or while running)
 - Finger assembly is located on a fixed mount with quick change connections
 - Pusher setup remains very similar between ware types with ware spacing remaining constant
 - Job setup time is minimized
 - Pocket Air Fingers are available for a variety of belt advances and ware sizes
 - Matching belt advance and container size provides the best ware handling
 - Independent Pocket Air Controls
 - The Upper cylinder extend/retract is separate from Pocket Air on/off
 - Ware handling can be adjusted for optimum performance
 - Fully integrates into Emhart's Forming Controls
 - All pertinent job information is saved and can be readily recalled

Pocket Air Fingers permit the Glass industry to readily produce a wide variety of glass containers at ever-increasing production rates and operating efficiencies.

7. Drawings that help with quoting and specifying of Pocket Air Fingers

Drawing #	Description
317 -5795	Chart for 317 Upper Cylinder Pocket Air Fingers
560-5196	Chart for 560 & 860 Upper Cylinder Pocket Air Fingers
117-8077	Pusher air piping options
117-8170	Operating air supply piping
117-8181	860 air piping
117-8182	Pneumatic conveyor schematic
191-24381	Ware spacing / Firing order chart
191-25712	Tandem ware spacing / Firing order chart
860-1023	Pusher profile chart
560-52-03	Upper Cylinder assembly W/ 5" stroke and Pocket Air Fingers
560-79	E Conveyor - Valve assemblies PAF and Bottle Air Guide
560-95	Pocket Air Finger Operation Instructions
560-107	Valve kit for Independent Pocket Air
560-5282	Electro-pneumatic Control schematic (Pocket Air Fingers)