

2024 INNOVATION CHAMPIONS CONTEST

Sliding/Swiveling Hose Holder

COUNTY: Walsh County Highway Department

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PROBLEM STATEMENT: The air compressor is used to clean out asphalt crevices, filled with sand, rock, and other debris, before filling the crevices with sealant. The hose on the air compressor would drag on the ground and this would wear off the 4-ply coating. In an effort to reduce the wear on the hose, the hose was pulled only short distances which meant the person with the hose stayed close to the moving pick-up and towed compressor. This increases the hazardous conditions for the person dragging the hose, because the driver is challenged with always seeing that person.

SOLUTION: Designed and fabricated the sliding/swiveling hose holder so the hose wasn't dragging on the ground, and wearing off the 4-ply coating. The hose is now easier to move because it is not being drug on the ground. The holder is designed with a swivel arm and a track with sliders, which makes it easier to prepare a larger area of a single lane for crack sealing without moving the vehicle. The swivel arm and sliders on the track allow the person cleaning the asphalt crevices to be further away from the air compressor vehicle.

The hose holder is designed with telespar as the base and is bolted to the top of air compressor. A piece of rubber is placed under the telespar to prevent scratching. For reinforcement and strength, two-inch telespar is used inside the bottom of the two and one-half inch upright (arm) telespar. This is connected with the curved bolt. The ball bearings are placed at the top and bottom of the 8-inch insert which enables the arm to swivel. The 9-inch bolt attaches the base and upright telespar. The ratchet strap, attached to the compressor's lift ring and at the high point of the upright telespar, provides additional strength and reinforcement for the arm.

LABOR, EQUIPMENT, AND MATERIAL:

Equipment used to build innovation:

Chop saw

Materials:

Salvage material:

Garage door track – 4 ft.

Door sliders (wheels) – 2

2 hose straps (attach to the sliders and hose)

Telespar:

Base - 40"L x 2" x 2½"

Upright – 36"L x 2 ½" x 2 ½"

Insert – 8"L x 2" x 2" (at bottom)

Insert – 18"L x 2" x 2" (at top)

4 – bolts, 1"x 3/8"

1 – curved corner bolt (used at base and bottom of upright telespar)

Ratchet strap

Rubber

New material:

Bearings - 2

1 – bolt & nut, 9"x1"

Total Labor Hours:

(Note: time includes design and discussion.)

2 – people

1 person - 4 hrs.; 2d person – 8 hrs.

COST SUMMARY:

2 ball bearings = \$40

1 – bolt & nut (9"x1") = \$15

Total Cost: \$55 plus labor

SAVINGS AND BENEFITS:

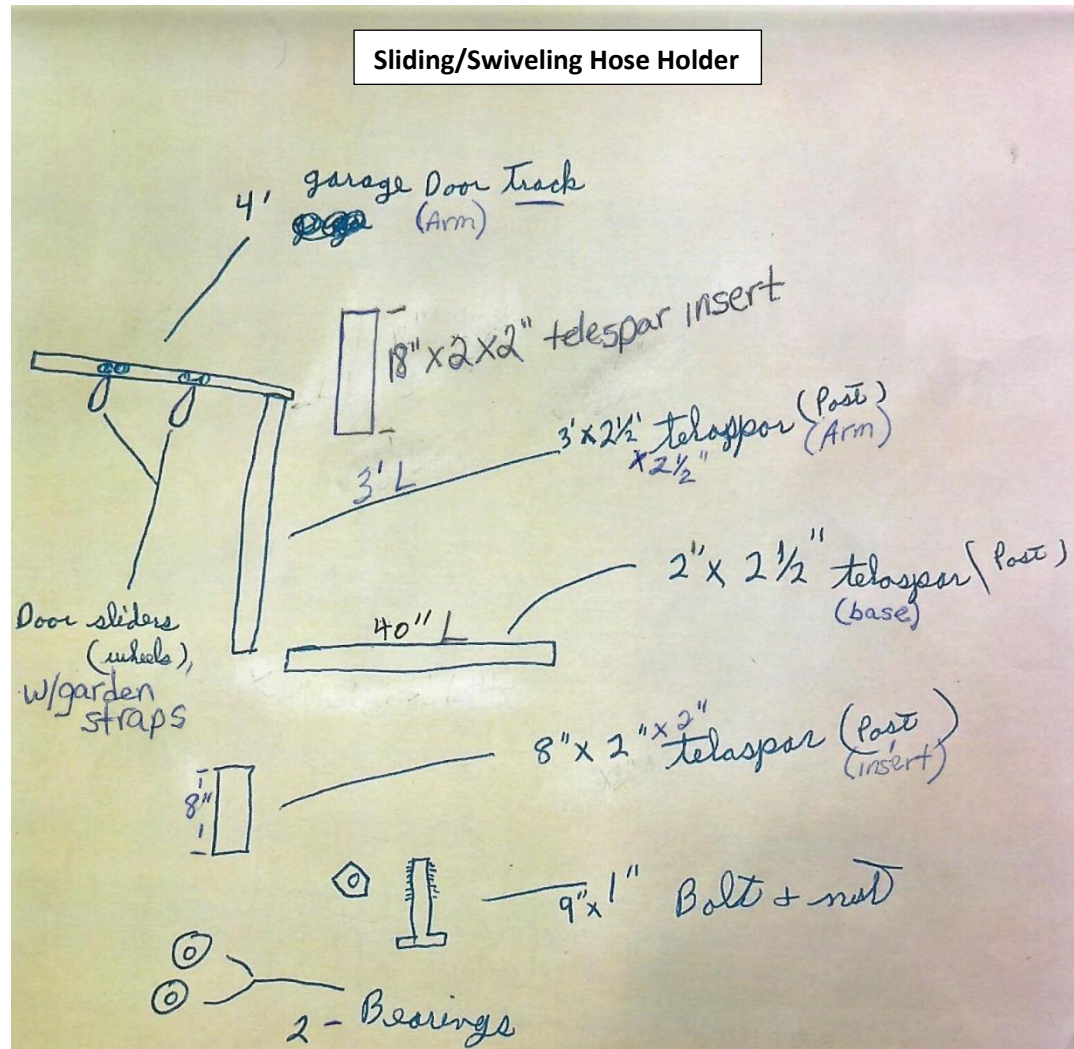
The coating on the air compressor hose no longer wears as quickly as it did. With the hose suspended on the holder, it is easier to move and less labor intensive. Employee fatigue is reduced so the task is more easily completed. With the sliding/swivel arm holder, more area of a single lane can be prepped without moving vehicles. The person with the hose is better able to stay clear of the pickup and air compressor when it is moved. The driver has a better visual of the person with the hose. The road department has experienced increased job efficiency and increased safety for the road crew and cost savings in time and money.

ANNUAL OPERATING COSTS:

Prior to using the innovation – Because the air compressor hose was dragging on the asphalt road, the 4-ply coating on the hose would wear off. In an effort to reduce the wear, smaller surface areas were cleaned, so vehicles were moved more often. In addition, the person using the hose to remove debris from the asphalt crevices would stay closer to the vehicles which in turn increased hazards for that person. Dragging the hose was labor intensive would cause fatigue, which in turn increases the possibility for injury. More time was needed to complete those projects. The cost for hose replacement is approximately \$100.

After using the innovation – The 4-ply coating on the air compressor hose no longer wears off due to dragging on the asphalt. Less time is spent on moving vehicles and the task of pulling the air compressor hose isn't as labor intensive. Road crew personnel are able to keep a greater distance from the vehicles in tow when cleaning the asphalt crevices.

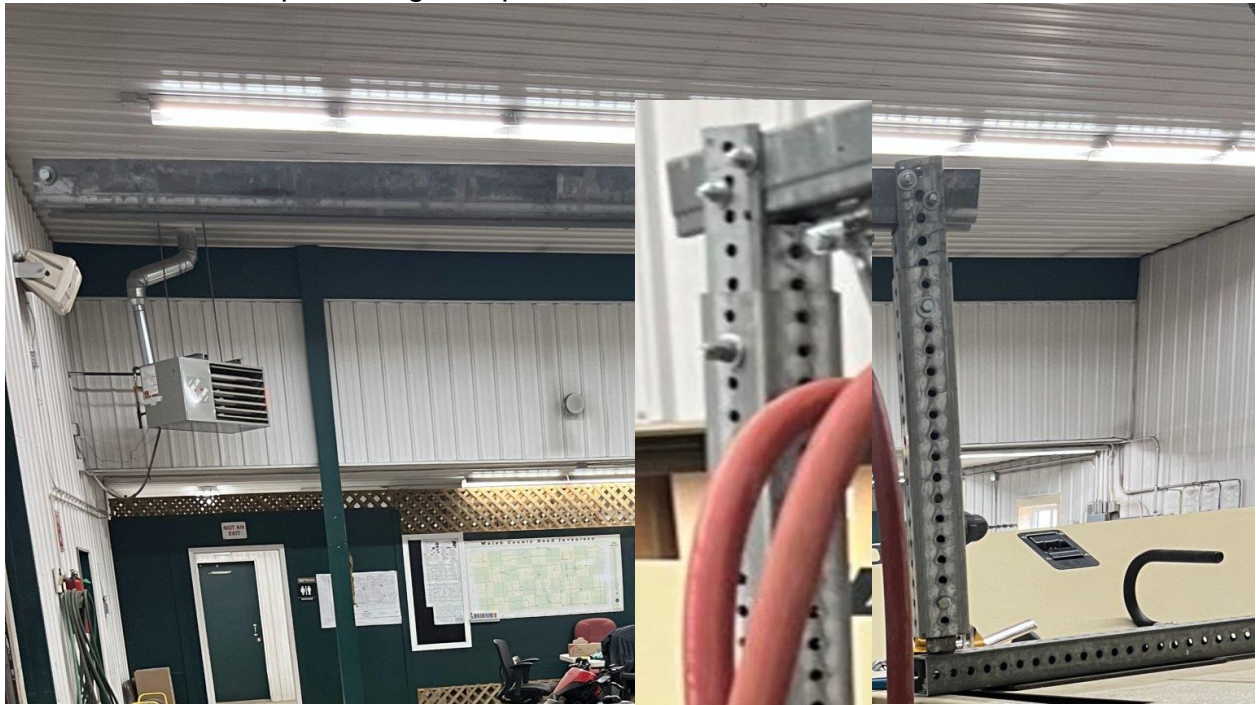
SCHEMATIC:



Sliding/swiveling hose holder



Holder with close up showing telespar insert



Videos



Sliding Swiveling
Hose Holder.mp4



Hose Holder in
action.mp4