Oct. 18, 1955

E. C. CARSON

2,720,941

CONVEYOR CHAIN LUBRICATORS

Filed Sept. 26, 1952

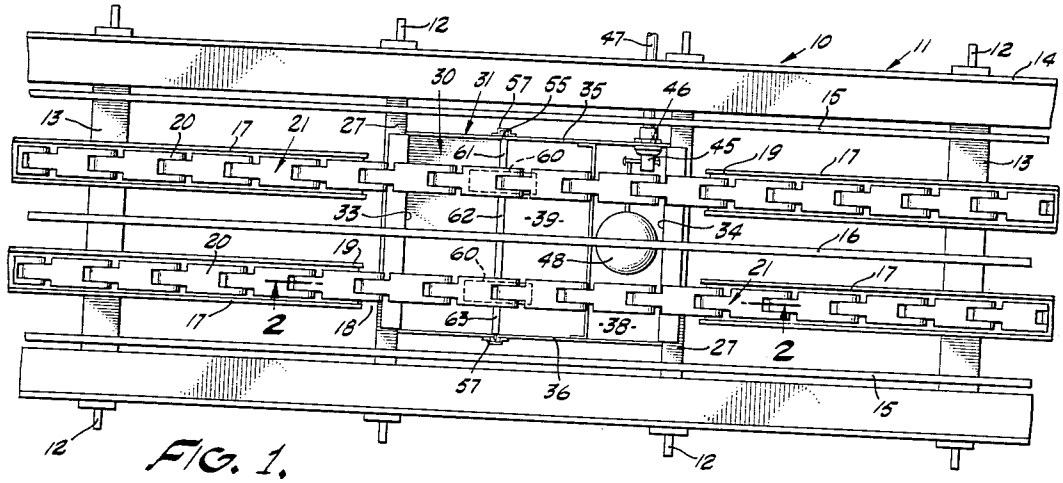


FIG. 1.

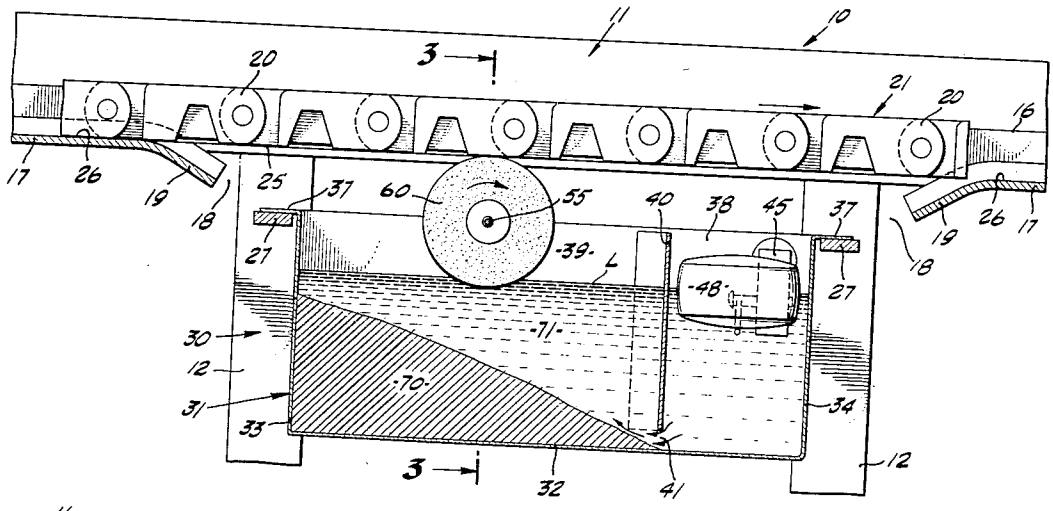


FIG. 2.

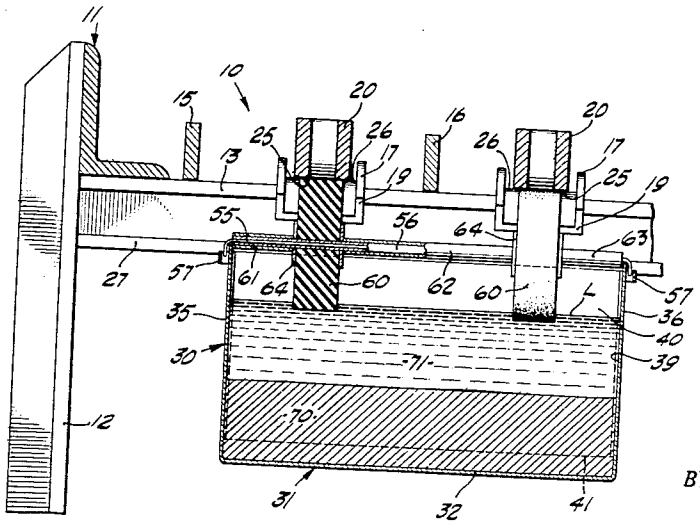


FIG. 3.

ELMER C. CARSON
INVENTOR.

BY

ATTORNEY

United States Patent Office

2,720,941

Patented Oct. 18, 1955

2,720,941

CONVEYOR CHAIN LUBRICATORS

Elmer C. Carson, Glendale, Calif., assignor to Knudsen Creamery Co. of California, Los Angeles, Calif., a corporation of California

Application September 26, 1952, Serial No. 311,769

2 Claims. (Cl. 184—5)

This invention relates to chain lubrication and particularly to the lubrication of the meeting surfaces of a horizontal conveyor chain and a guide track over which said chain slides.

Where chain conveyors are employed in handling cases of fresh food as in dairies, dairy product processing plants and fresh fruit and vegetable packing houses, the cleanliness regulations require that these conveyors be steam-cleaned regularly. This operation removes all lubricants which might be upon the chain and spreads this over the floor which, when oil is used as a lubricant, aggravates the floor cleaning problem.

It has accordingly become the practice to employ soap as a lubricant for these meeting surfaces on the chains and chain guides in this type of conveyor, particularly where these are used in processing food products. The soap thus used as a lubricant is readily washed away in the steam cleaning process and aids in cleaning the chain and surrounding equipment.

The use of soap in this manner as a lubricant has proved expensive, however, as the mechanisms provided for applying the soap have tended to apply excessive quantities of this. One factor contributing to this is that these continue to apply soap solution to the chains even when the latter are stopped, thus accumulating an excess of soap in the chain guide tracks and running off onto the floor while the chain is halted. The excess thus applied, of course, is wasted.

It is an object of the present invention to provide a simple conveyor chain lubricator which will automatically apply soap solution to the chains of a chain conveyor in a manner which will result in an economical use of the soap and yet assure adequate lubrication of said chains.

It is another object of the invention to provide an automatic conveyor chain lubricator in the form of a unit which will hold a supply of soap paste and will automatically convert this into a soap solution suitable for applying to the conveyor as this solution is required.

It is a still further object of the invention to provide such a unit having a mounting in the frame of the conveyor permitting said unit to be readily removed from and re-inserted in operating position relative to said conveyor when this is necessary for cleaning said unit.

The manner of accomplshing the foregoing objects as well as further objects and advantages will be made manifest in the following description taken in connection with the accompanying drawings in which

Fig. 1 is a plan view illustrating a chain conveyor in which a lubricator unit comprising a preferred embodiment of the invention is installed.

Fig. 2 is an enlarged cross sectional view taken on the line 2—2 of Fig. 1 showing the solution tank of the invention in cross section.

Fig. 3 is a cross sectional view taken on the line 3—3 of Fig. 2 and shows the detailed structure of the porous solution applying wheels and the structure of the mounting provided for these.

Referring specifically to the drawings, the invention is there shown as incorporated with a chain conveyor **10** having a frame **11** including T-section legs **12** which are connected near their upper ends by cross bars **13**. Longitudinal angle frame members **14** rest on cross bars **13** and are preferably connected to the legs **12** and cross bars **13** as by welding. Also supported on and welded to the cross bars **13** are longitudinal guides **15** and **16** for boxes, crates or cases which are transported on the conveyor **10**.

Interspersed between the guides **15** and **16** and symmetrically disposed relative to the latter are channel chain guides **17** which are also supported on and welded to the cross bars **13**. As shown in Figs. 1 and 2, there is a gap **18** formed in the chain guides **17**, end portions **19** of said guides adjacent said gap being inclined downwardly to assist in guiding chains back onto the chain guides **17** after said chains have closed said gap.

Resting in and traveling along the chain guides **17** are upper flights **20** of endless conveyor chains **21** which perform the function in the conveyor **10** of supporting boxes, crates or cases and conveying any of these various types of commercial containers loaded with a fresh food product. The lower surfaces **25** of chain flights **20** slide on upper surfaces **26** of the chain guides **17** and it is for the purpose of keeping these two surfaces constantly lubricated that the present invention is provided.

Extending across opposite ends of the space comprising the gap **18** in the chain guides **17** are a pair of rails **27**, opposite ends of which are supported on an adjacent pair of legs **12** with said legs positioned so as not to obstruct access to the space immediately above said rails from one or both sides of the conveyor **10**.

Slidably supported on the rails **27** is a conveyor chain lubricator **30**, this including a tank **31** which is preferably formed of galvanized sheet steel or of sheet stainless steel. This tank has a bottom **32**, side walls **33** and **34** and end walls **35** and **36**. Bent outwardly from upper edges of side walls **33** and **34** are supporting flanges **37** which rest on the rails **27**. Secured to end walls **35** and **36** and dividing the interior of the tank into a float basin **38** and a soap solution basin **39** is a preferably imperforate baffle wall **40**, the lower edge of which is spaced a slight distance upwardly from the tank bottom **32**, thus forming a narrow water transfer passage **41** for the transfer of water from the basin **38** to the basin **39**. The wall **35** is apertured near its upper edge adjacent the wall **34** to receive a float valve **45** which is secured in place on said wall by a nut **46** (Fig. 1). This valve is constantly supplied with water under pressure from a water system (not shown) to which said valve is connected by a flexible hose **47**. Valve **45** is equipped with a float **48** which operates in the well-known manner to shut off a flow of liquid from said hose **47** through the valve **45** and into the basin **38** when liquid in this basin rises to a given level L. When water in said basin drops below level L, the float **48** is lowered causing the valve **45** to admit water into the tank **31** to restore the water therein to the level L.

Upper edges of walls **35** and **36** are notched to receive opposite end portions of an assembly wire **55** which extends through a tube **56**, the opposite ends of said wire being bent downwardly to extend through small strap brackets **56** provided on said walls which operate to prevent rotation of said wire and thus cause said wire to support the tube **56** in a given transverse plane which substantially bisects the solution basin **39** longitudinally.

Rotatably mounted on the tube **56** are solution transfer wheels **60** which are preferably molded of sponge synthetic rubber and are spaced apart from each other and held in the same vertical planes respectively that the chain flights **20** travel along, by spacer tubes **61**, **62** and **63** and by washers **64** which are apertured to loosely fit

the tube **56** and lie between the spacer tubes **61**, **62** and **63** and the adjacent faces of the wheels **60**.

Operation

To operate the conveyor chain lubricator **30**, this is slipped in place so as to be supported by the rails **27**, as shown in the drawings, with wheels **60** pressed upwardly against chain bottom surfaces **25**. A quantity of soap **70** in paste or powder form is deposited in the basin **39** of the tank **31** so as not to completely close the water transfer passage **41** at the bottom of the baffle wall **40**, and hose **47** is connected to a supply of water under pressure. The water entering the basin **38** through the valve **45** passes from this basin through the passage **41** into the basin **39** and in so doing picks up soap from the mass **70** thereof so as to form a soap solution **71** which is suitable for use in lubricating the chain and guide surfaces **25** and **26**.

With the lubricator **30** thus installed in place and prepared for operation, any movement of the upper chain flights **20** in either direction along the chain channel guides **17** causes these chains to rotate the lubricant feed wheels **60** thereby transferring soap solution **71** to the bottom chain surfaces **25**. A portion of this lubricant is, of course, carried along with the chains and transferred from the surfaces **25** to the guide surfaces **26** so that the entire length of these surfaces is lubricated.

From the above description it is clear that an adequate supply of soap solution is supplied to the wearing surfaces **25** and **26** throughout the operation of the conveyor **10**, yet the feeding of solution to these surfaces is halted throughout the periods the conveyor is not running. This prevents the feeding of an excessive amount of solution onto the conveyor and the wasting of the solution, while assuring adequate lubrication of the chain conveyor.

The claims are:

1. In an automatic lubricator for conveyor chains, the combination of: a soap solution tank; means for removably mounting said tank beneath the chains of a plural chain conveyor; a baffle wall provided in said tank dividing the interior of said tank into a float basin and a soap solution basin, the lower edge of said wall being spaced a short distance above the bottom of said tank to permit water to flow from said float basin into said solution basin at a point just above the bottom of said tank, said solution basin being adapted to have deposited therein a quantity of soap in paste form; float valve means for introducing water into said float basin to maintain the liquid in said tank at a given level and to cause water to flow beneath said baffle wall and along the upper surfaces of said soap deposit, thereby filling said solution basin up to said level with soap solution formed by mixing said water with said soap paste; a pair of wheels the peripheral portions of which are formed of absorbent material and having a diameter in excess of the vertical space between the lower faces of said conveyor chains and said liquid level; and means on said tank for mounting said wheels for free rotation on a horizontal axis with said wheels disposed in the vertical planes of said chains with upper peripheral portions of said wheels contacting lower faces of said chains and with the lower peripheral portions of said wheels dipping into said soap solution in said solution basin.

2. A combination as in claim 1 in which said tank is provided with horizontal flanges extending in opposite directions from a pair of opposite walls thereof; and guide rails provided for supporting said flanges and said tank for permitting said unit to be slid along said rails to insert said tank into operative relation with said conveyor chains and to remove said tank from such a position for cleaning the latter.

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