Aug. 4, 1942. R. M. GARDNER 2,292,220

LAMP TUBING CONVEYER

Filed Sept. 18, 1940 2 Sheets-Sheet 1

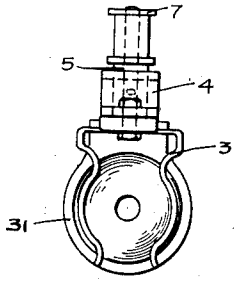

Fig. 1

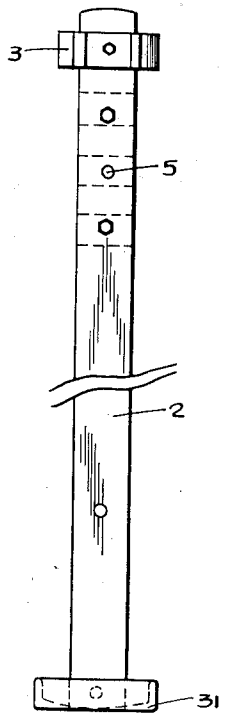

Fig. 2

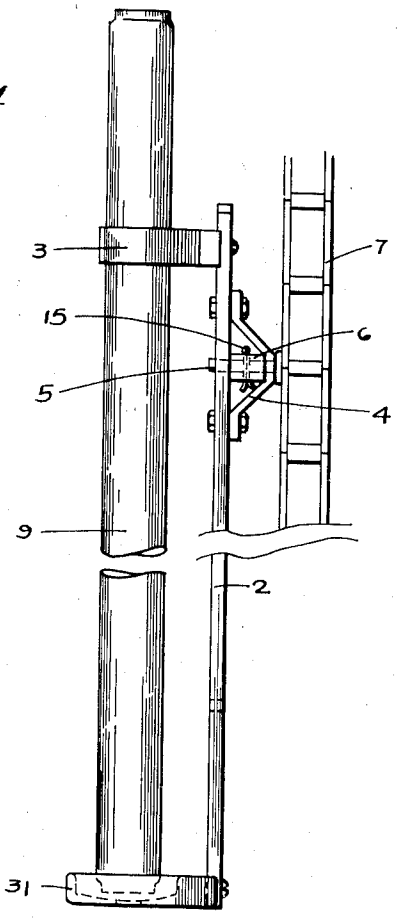

Fig. 3

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LAMP TUBING CONVEYER

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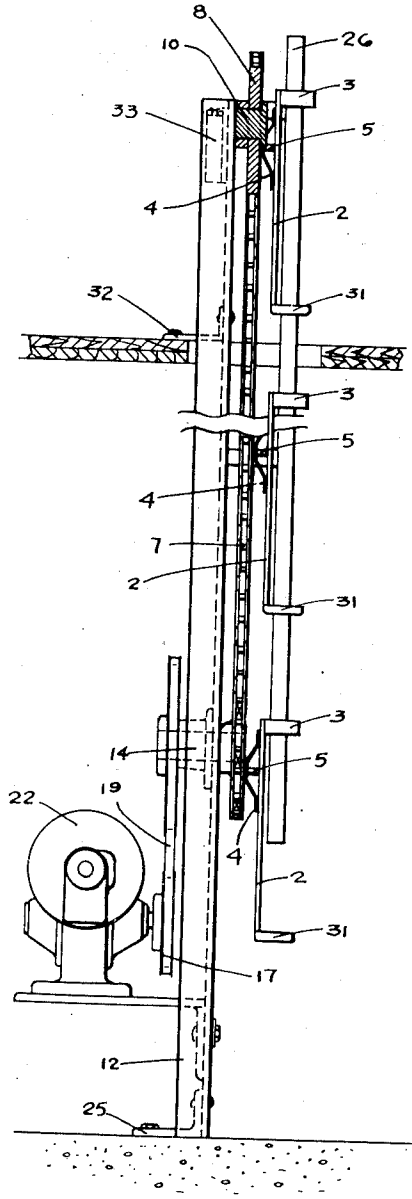

Fig. 4

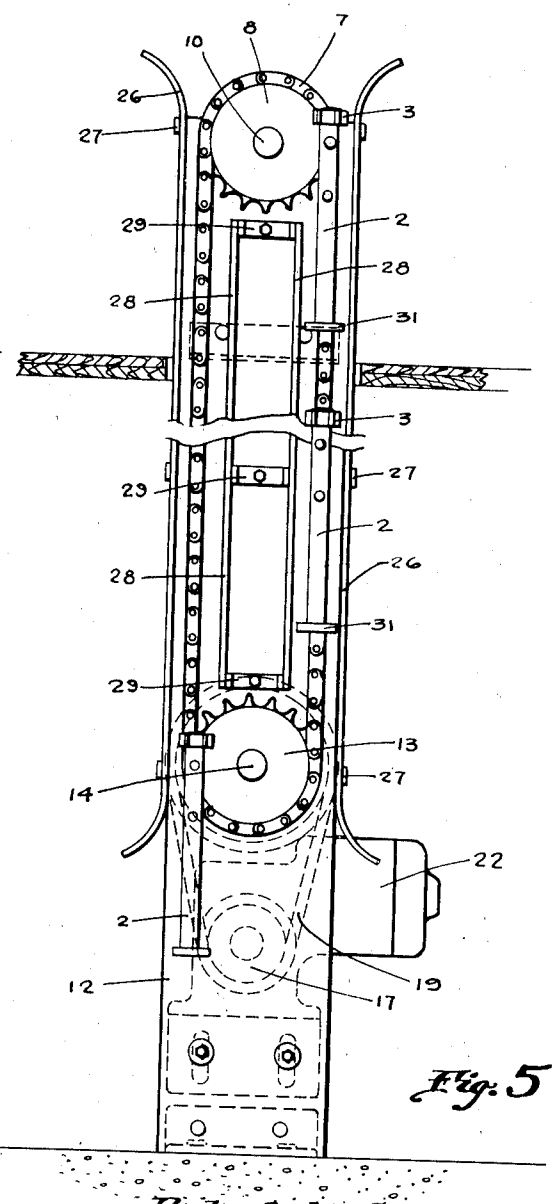

Fig. 5

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UNITED STATES PATENT OFFICE

2,292,220

LAMP TUBING CONVEYER

Roland M. Gardner, Swampscott, Mass., assignor to Hygrade Sylvania Corporation, Salem, Mass., a corporation of Massachusetts

Application September 18, 1940, Serial No. 357,299

1 Claim. (Cl. 198—131)

This invention refers to a conveyer for glass bulbs and more particularly to a conveyer for carrying fluorescent lamp bulbs from the machine in which they are baked to the machine at which the glass stems are sealed to the bulbs.

In the manufacture of fluorescent lamps it is desirable to pass the glass bulb to which a coating of luminescent material has been applied through a heating oven which will bake the luminescent coating in a manner as to drive off all impurities such as the binder used to obtain the proper suspension of the luminescent materials, and thus leave the coating of luminescent material that is desired. The next step after this baking is the sealing-in.

Accordingly, therefore, an object of this invention is to provide a means for conveying the bulbs from the baking machine to the sealing-in machine.

Another object is to provide a mechanical means by which the bulbs may be transferred from the position at which they are unloaded from the baking machine to the position at which they are loaded on to the sealing-in machine.

A further object is to provide a means for conveying the bulbs that will reduce the number of times they are handled and thus reduce the losses often caused by unnecessary handling.

Other objects, advantages and features will be apparent from the specifications which follow taken in conjunction with the accompanying drawings in which:

Figure 1 is a top view of the pendulum assembly.

Figure 2 is a front elevational view of the pendulum assembly.

Figure 3 is a side elevational view of the pendulum assembly showing a bulb in position.

Figure 4 is a side elevational view partly in section of the bulb conveyer.

Figure 5 is a front elevational view of the bulb conveyer.

Similar reference characters refer to similar parts throughout the several views of the drawings.

This invention consists of a series of pendulum devices for carrying bulbs attached at various points along an endless chain conveyer. This conveyer may be in a horizontal, a vertical, or an acute angular plane without departing from the spirit of my invention. However, I have found that the conveyer is more readily adaptable, in my particular case, when it is in a vertical plane, due to the relative location of my baking and sealing-in machines. If the conveyer in my invention were to be used in a horizontal or angular plane, a few minor changes, readily apparent, would be necessary to adapt the conveyer to the desired plane.

The metal pendulum **2** is attached to the conveyer chain **7** through the metal pendulum stud **5**. This stud **5** is attached to the pendulum at its upper extremity so as to create the pendulum effect. The metal pendulum strap **4**, through which the pendulum stud **5** passes is bolted to the pendulum **2**. The pendulum stud **5** which holds the pendulum to the conveyer chain **7** passes through the metal pendulum spacer **6** and the pendulum strap **4** and is held therein by the cotter pin **15**. The use of a pendulum spacer and pendulum strap through which the pendulum is attached to the conveyer chain provides a firm and positive connection and at the same time provides the proper and necessary spacing of the pendulum away from the conveyer chain.

At the upper extension of the pendulum **2** is attached the pendulum clip **3** made of Phosphor bronze or some similar flexible material. At the lower extension of the pendulum **2** is the pendulum cup **31**. The operator takes the bulb **9** as it comes out of the baking machine and sets it in the pendulum bulb carrying device by inserting the bulb **9** into the pendulum clip **3** at a point such that the bottom of the bulb will rest in the pendulum cup **31**. Thus the bulb is held by the pendulum clip **3** and the pendulum cup **31**.

By providing a means for raising or lowering the position of the cup **4** on the pendulum **2** and by providing pendulum clips of various sizes, the pendulum bulb carrying devices may be readily adapted to bulbs of various lengths and diameters.

The conveyer chain **7**, to which is attached a series of spaced pendulum bulb carrying devices as described above, is geared on the idler sprocket **8** and the drive sprocket **13** through the idler shaft **10** and the drive shaft **14** respectively. The drive shaft **14** may be driven by the motor **22** through the belt **19** and drive pulley **17**.

I have used this conveyer in a vertical plane because my bulb baking machine is on one floor and my sealing-in machine is on the floor above, directly over it. Thus the conveyer runs up from one floor to another. The sprockets **8** and **13**, about which the conveyer chain **7** turns, are firmly attached to the frame channel **12** which is bolted to the floor through the bottom floor angle **25** and the top floor angle **32**. Thus this frame

channel 12 provides a base on which the entire conveyer mechanism is mounted.

Due to the fact that the pendulum 2 pivots about the pendulum stud 5, some check must be provided to limit the area through which the pendulum 2 may swing. This is done by providing the pendulum guides 26 which are attached to the frame channel 12 through the series of pendulum guide braces 27.

It is important that the pendulum 2 pivots freely on the pendulum stud 5, for it is desirable that the pendulum maintain its perpendicular position throughout the complete circuit of the conveyer chain. This is especially true when the pendulum makes its circuit about the idler sprocket 8 and the drive sprocket 13. To further aid in making sure that the pendulum 2 is always perpendicular, the pendulum cup is made of a metal of sufficient weight to exert a continuous downward pull on the pendulum.

The chain guide 28 is attached to the channel frame 12 through the chain guide braces 29 to act as a guide for preventing the chain 7 from swinging into the center.

The pulley 17 is of the variable pitch diameter type as shown in Figure 5. Thus this pulley may be adjusted to synchronize the speed of the conveyer with the speed of the machines between which it operates.

The chain tightening mechanism 33 is attached to the idler shaft 10 and the idler sprocket 8, thus serving as a means for inserting or taking out links of the chain 7 in order to keep the chain from getting loose.

Safety guards and devices similar to those now in common use in belt or conveyer chain machines may be used to encase all parts of the conveyer but those which must be free in order for the conveyer to operate.

What I claim is:

Apparatus for conveying elongated tubular bulbs on an endless chain conveyer, said apparatus comprising: a plurality of studs projecting from said endless chain; a pendulum suspended from each of said studs at the outer ends thereof; a pendulum spacer concentric with each of said studs and through which said studs extend; a pendulum strap supporting each of said pendulums, said strap being attached to the back of each of said pendulums and having its rearward extremity attached to the inner end of said stud from which the pendulum is suspended; a fixed flexible clip attached to the top of each of said pendulums; and a cup mounted at the bottom of each of said pendulums.

ROLAND M. GARDNER.