Oct. 25, 1966 R. ZIPPERLIN 3,280,795

SPRAY MEANS HAVING FLYING MOVEMENT WITH WORK

Filed Nov. 21, 1962

2 Sheets-Sheet 1

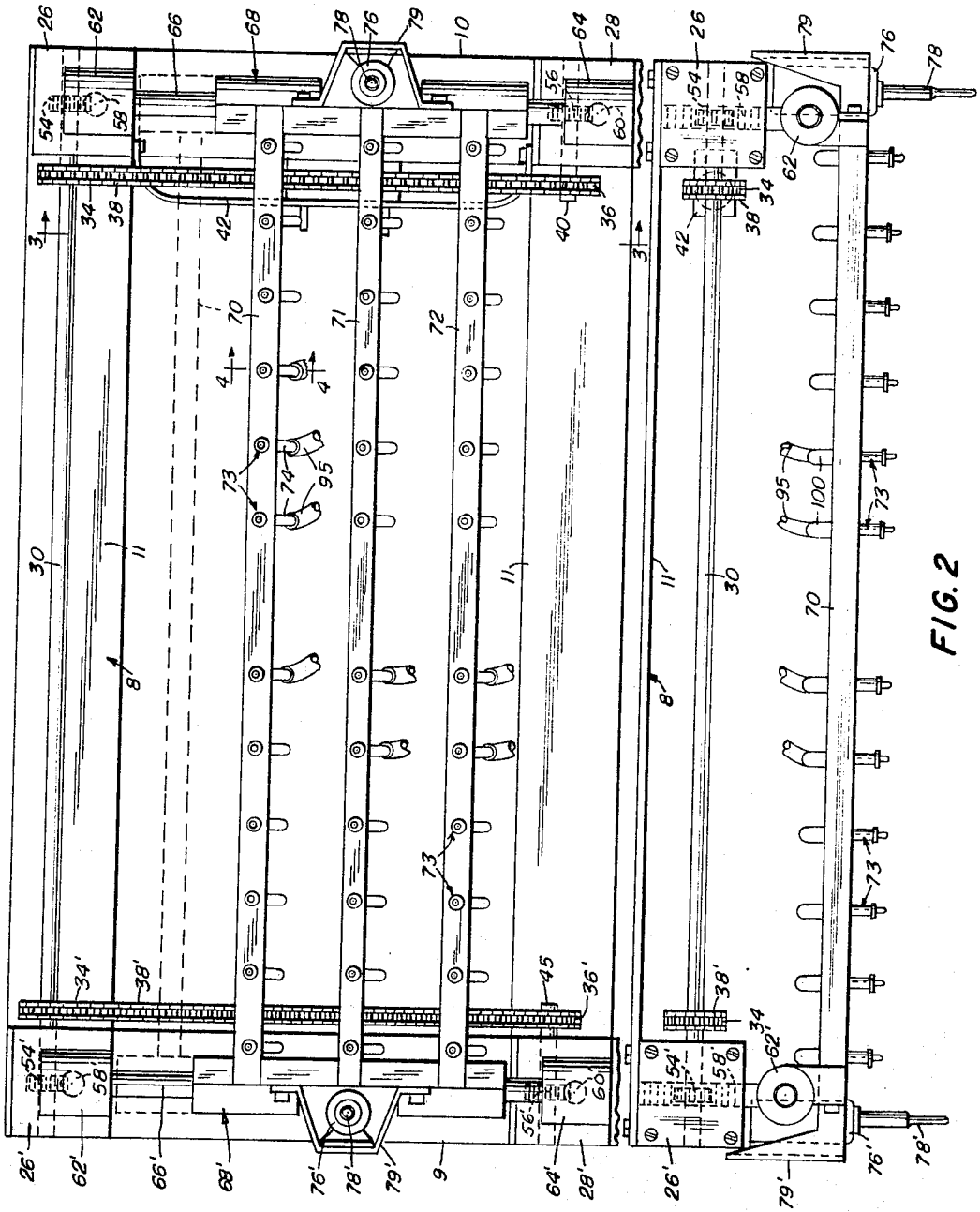


FIG. 2

FIG. 1

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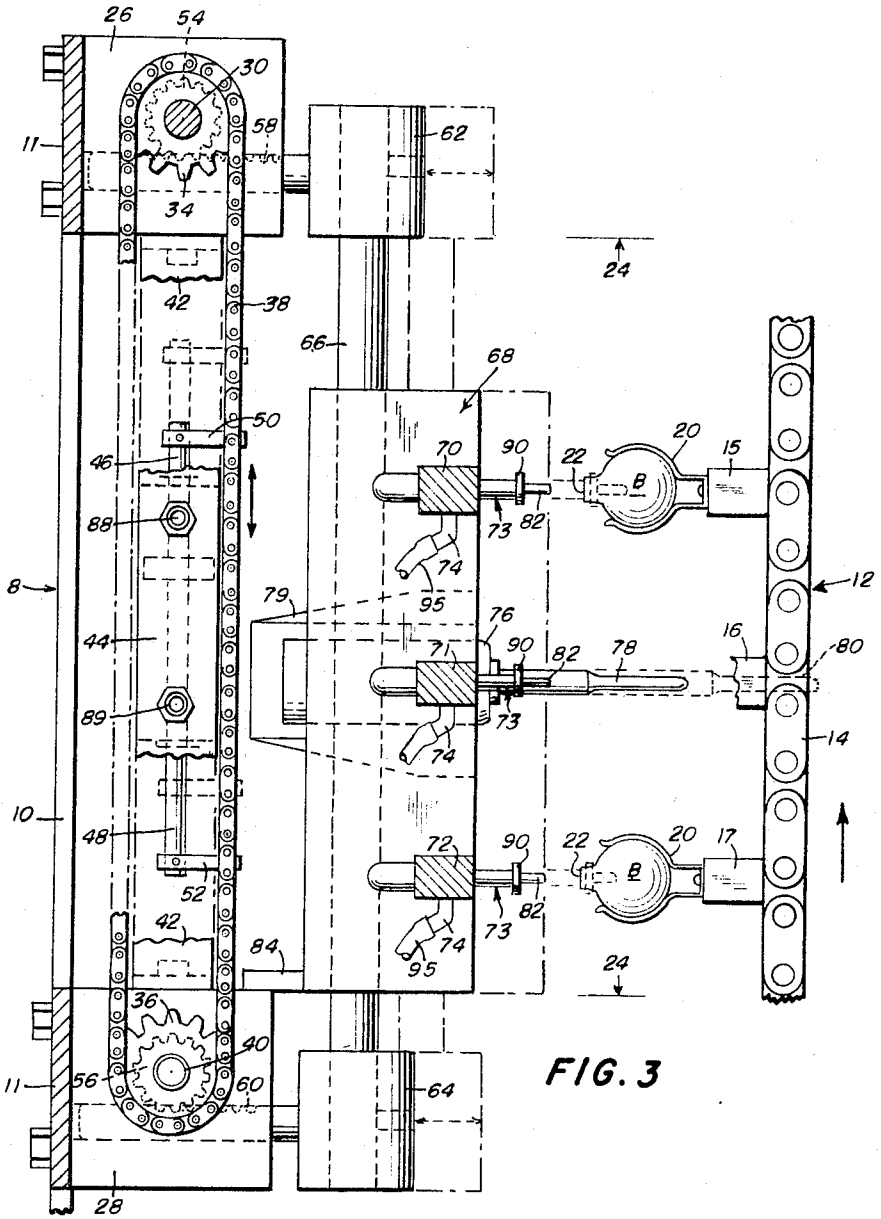


FIG. 3

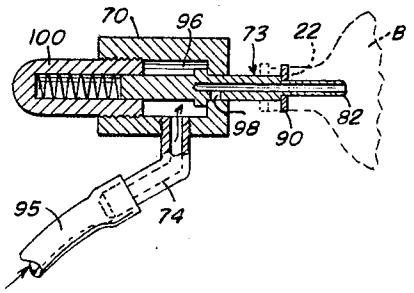


FIG. 4

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SPRAY MEANS HAVING FLYING MOVEMENT WITH WORK

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1 Claim. (Cl. 118—313)

This invention relates to an apparatus for decorating items on a moving conveyor, and more specifically is directed toward an apparatus for coating the interior of container-like objects.

In the art of decorating Chistmas balls or other bulb-like decorative items, many interesting ornamental effects are obtained by coating the interiors of translucent or semi-translucent items. Heretofore, the cost of performing such interior coating has been considerable, because it either had to be done by hand and, if using production line techniques, required a work stoppage that effected other processing equipment capable of performing with a continuously moving conveyor. Therefore, a principal objective of this invention is in the provision of means for relating the movement of a decorating means with the movement of a continuously moving conveyor, carrying the means into balls mounted on the conveyor, permitting a coating dwell period, and removing the nozzle just prior to the termination of the related movement.

For additional beauty, it is conventional to coat the exterior of Christmas balls with a silver nitrate solution prior to coating the ball with a colored lacquer. A further objective of this invention is in the provision of means whereby the silver nitrate is quickly and efficiently coated to the interior of the balls and whereby the same beauteous effect is retained after the exterior lacquer coating is applied.

Another important objective of this invention is to provide a continuously moving conveyor, upon which is mounted a plurality of Christmas tree ornaments, in a predetermined pattern, and providing means for simultaneously penetrating the ornaments with a like pattern of spray nozzles during a portion of the path of travel of the conveyor.

A further objective of this invention is to provide a framing arrangement for carrying a plurality of decorating nozzles in a predetermined pattern identical to a pattern in which a plurality of workpieces are mounted on a moving conveyor, with first means for causing the framing structure to move concurrently with the bulbs and a second means to project the decorating nozzles into the workpieces during said concurrent movement.

A further objective of this invention is to provide a device of the character described in which the activating means are simple hydraulic cylinders and the control means are a series of micro switches operable in timed sequence.

A still further objective of the invention is to provide a framework for use in combination with a constant speed conveyor with means to attach said framework to said conveyor for movement therewith along a selected path and further means to move said framework toward said conveyor as it traverses this selected path.

Another important objective of the invention is to provide an efficient low-cost means for decorating the interior of Christmas tree bulbs or the like mounted on a production line conveyor without hindering or effecting further processes at precedent or subsequent work stations.

These and other important objectives and advantages of the invention will be more fully understood upon a reading of the following specification taken in view of the attached drawings wherein:

FIGURE 1 is a front elevation view of the invention;

FIGURE 2 is a plan view;

FIGURE 3 is a sectional view along the line 3—3 of FIGURE 1; and

FIGURE 4 is a sectional view along the line 4—4 of FIGURE 1 showing the interior of a spraying nozzle.

Referring now more particularly to the drawings wherein like elements are indicated by like numerals, the numeral 8 designates a stationary support disposed adjacent and generally parallel to a vertically directed conveyor 12. The support consists of a pair of uprights 9 and 10 and a plurality of cross bars 11. The conveyor is comprised of two parallel link chains 14, one each of which is disposed opposite an upright. At spaced intervals, the chains carry a series of ball or bulb holding brackets 15, 16, and 17 therebetween. As viewed in FIGURE 1, the vertical bulb supporting conveyor 12 is toward the viewer and when viewing FIGURE 2, the conveyor is in the margin. The relationship between support and conveyor can best be seen in FIGURE 3.

The ball holding brackets each support approximately twelve bulb retaining grips 20 thereon. The grips secure the bulbs or workpieces B with their respective openings 22 toward the support. Although the conveyor 12 is shown moving vertically, it is to be understood that the direction of movement can be horizontal or inclined without effecting the breadth of this invention. In most instances, the conveyor 12 leads to and from other work stations, and for purposes of this description a particular segment of the path of travel of the conveyor will be termed as a decorating path and this segment is indicated by the numeral 24. The conveyor 12 is of an endless variety and is driven by conventional means not considered a part of this invention. The apparatus for supporting the decoration applying elements are basically divided into first and second frames. The first frame includes that structure for movably supporting the decorating elements throughout the length of path 24. The second frame is a sub-frame including the structure for movably supporting the decorating elements toward and away from the decorating path. The operation of the two frames will be more fully understood hereinafter where it will be seen that the first frame slidably supports the second frame.

The uprights 9 and 10 and the structure supported thereby are, for the most part, the mirror image of each other and, in some instances, only the supported structure of upright 10 will be described, and like elements associated with upright 9 are given identical numbers with prime-marks.

The upright 10 includes an upper arm 26 and a lower arm 28, and upright 9 includes a corresponding upper arm 26′ and a corresponding lower arm 28′. Extending horizontally between arms 26 and 26′ is an upper shaft 30 to which a pair of sprockets 34 and 34′ are mounted inwardly of the upper arms. Extending inwardly of lower arm 28 is a sprocket 36, and extending inwardly of arm 28′ is a sprocket 36′. An endless chain 38 meshes with sprockets 32 and 36 and another chain 38′ extends between sprocket 34′ and sprocket 36′. The sprockets 36 and 36′ are respectively secured to the inner ends of stub shafts 40 and 45, which are, in turn, supported by the lower arms 28 and 28′.

A bracket 42 extending between the arms 26 and 28 supports a double acting cylinder 44 which has a pair of piston rods 46 and 48 extending from either end thereof. The cylinder body is fixedly mounted to bracket 42 and the piston rods 46 and 48 respectively carry a pair of chain link engaging lugs 50 and 52 at their outer ends. As seen best in FIGURE 3, as the piston rods reciprocate an oscillatory movement is engendered in sprockets 34 and 36.

A pinion 54 is coaxially supported on shaft 30 and, coaxially supported on shaft 40 is a pinion 56. The pinions are respectively caused to mesh with racks 58 and 60 which at their outer ends carry a pair of blocks 62 and

64. A connecting shaft 66 extending between blocks 62 and 64 carries a reciprocating slide member 68 thereon. Associated with upright 9 is an identical slide member 68' carried by a connecting shaft 66'. The other supporting structure for 68' is the same as that provided for the reciprocating movement of slide 68.

Bridging the distance between slide members 68 and 68' are a plurality of nozzle supporting members 70, 71, and 72. Each of the members carry a plurality of nozzle sprays 73 which in turn are connected to a decorating substance carrying conduit 74. As previously stated, this substance is normally silver nitrate.

Each of the slide members 68 and 68' respectively carry hydraulic cylinders 76 and 76' which have plunger arms 78 and 78' extending toward their respective link chains 14. The cylinders 76 and 76' are supported by brackets 79 and 79' which are in turn secured to their respective slide members by any conventional means. The cylinders are located at the outer ends of the middle support bar 71. The plungers are narrowed at their outer end to enable them to penetrate and slidably engage the space 80 between adjacent links of chains 14 and 14'. As will be understood more fully hereinafter, the penetration of the plungers into the chains causes the slide members 68 and 68' to move with the chain throughout that segment of travel designated as 24.

The members 15, 16 and 17 each carry an equal number of balls spaced similarly to the spacing of the nozzles 73 on their respective support bars. The members 15, 16 and 17 are three selected supports on a chain which carries a great many of such supports.

In operation, the workpieces B are mounted to the grips 20 at a precedent location and travel toward the path segment 24. The slide members 68 and 68' are at their lower positions, and are resting on or near the upper surfaces of blocks 28 and 28'. Just prior to conveyor 12 reaching the position shown in FIGURE 3 a timed micro switch is tripped causing fluid to enter the cylinders 76 and 76.' The plungers 78 and 78' move outwardly and engage their respective chains at spaces 80. This penetration causes slide members 68 and 68' to travel with the chain and accurately orients the bulb pattern with the nozzle pattern. After full engagement of the plungers with the conveyor 12, a second micro switch is tripped which causes fluid to enter port 88 of the cylinder 44. Piston rods 48 and 46 and their associated lug members are caused to travel downwardly to effect a rotation in pinions 54 and 56. This movement causes the blocks 62, 62', 64, and 64' to move toward the conveyor as it carries the nozzles therewith. As the nozzles approach the workpieces the annular flanges 90, on each of the spraying nozzles, contact the peripheries of openings 22 when the tips 82 of the nozzles are properly positioned within the interior of the bulbs. A further movement of the nozzles causes the decorating substances under pressure in chamber 96 (from conduits 95) to reach the interior of the workpieces via an orifice 98. As will be easily understood by those skilled in the art, the spraying nozzles are of simple construction and are urged outwardly to a normally "off" position by a spring member 100.

As the slide members 68' and 68 approach their upper limit, the timed micro switch causes fluid under pressure

to enter port 89 of cylinder 44 causing the chain to reverse its direction and withdraw the spraying nozzles from the workpieces. After such withdrawal the plungers of cylinders 76 and 76' are withdrawn from the chain. After the plunger is withdrawn, the slide member returns to its original starting position by gravity. It should be noted that the elongated dimensioning of the plunger is such that in no instance will a rearward movement of the slide members be sufficient to remove the plungers from the chains prior to the removal of the nozzles from the interiors of the workpieces. The above described sequence is again repeated when a second series of bulb supporting bars are juxtaposed in parallel relationship with the slide members.

The micro switches for activating the flow of hydraulic fluid are of conventional timed sequence design. A convenient method of timing such micro switches is a rotatable constant speed shaft mounting a plurality of switch engaging cams.

In a general manner, while there has been disclosed an effective and efficient embodiment of the invention, it should be well understood that the invention is not limited to such an embodiment, as there might be changes made in the arrangement, disposition, and form of the parts without departing from the principle of the present invention as comprehended within the scope of the accompanying claim.

I claim:

A machine for moving a plurality of dispensing ends of decorating nozzles into the interiors of a like number of bulbs comprising:

a pair of driven parallel link chains having openings along their lengths,

a bracket extending between said chains and mounting said bulbs for movement with said chains,

a framework supporting said nozzles for movement along a segment of travel of said chains,

a pair of pointed chain-engaging members carried by said framework, one each of which is disposed perpendicular to one each of said chains and sized to be snugly received by said openings,

means causing said pointed members to engage said chains by penetrating said openings thereby causing said framework to move with said chains and means moving said nozzles into said bulbs after said members have penetrated said chains,

a source of decorative material said nozzles each including valves and second means opening said valve to communicate said source with the interior of said bulbs only when said dispensing ends of said nozzles are in the interiors of said bulbs.

References Cited by the Examiner

UNITED STATES PATENTS

2,316,972	4/1942	Pond	117—4
2,346,951	4/1944	Temple	118—3
2,597,968	5/1952	Baron	118—239
2,646,769	7/1953	Lindsay	118—323 X
2,660,978	12/1953	Dyne et al	118—323 X

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