United States Patent

[11] 3,633,536

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[54] **APPARATUS FOR PAINTING ARTICLES**
11 Claims, 19 Drawing Figs.

[52] **U.S. Cl.** **118/6,** 118/7, 118/70, 118/301, 118/324, 118/503, 118/642
[51] **Int. Cl.** **B05c 5/00,** B05c 11/12
[50] **Field of Search** 118/324, 301, 70, 322, 641, 642, 2, 7, 503, 6

[56] **References Cited**

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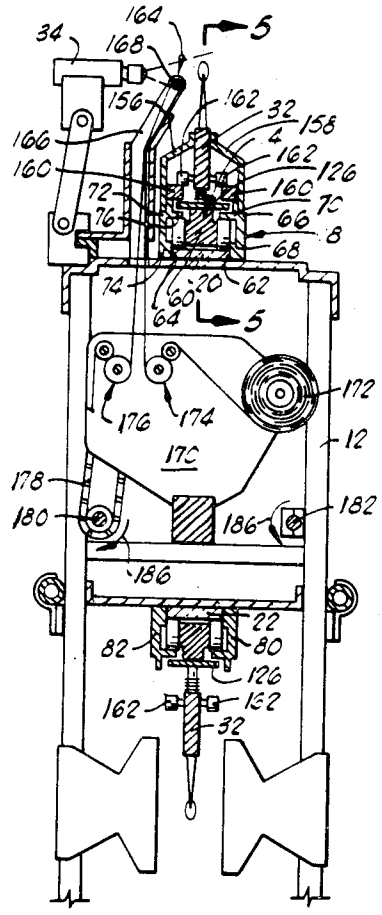
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ABSTRACT: The present invention relates to methods and apparatus for painting articles such as fishing lures, and the like. The articles to be painted are placed on a plurality of blocks movably secured to a plurality of carriage members which are connected together to form a continuous chain thereof. The chain of carriage members is movably secured to a continuous track, and is intermittently advanced over the track. As the articles are advanced, they are painted with paints of preselected color in preselected patterns, and the paint is dried and baked onto the articles. The painted and dried articles are then automatically removed from the apparatus.



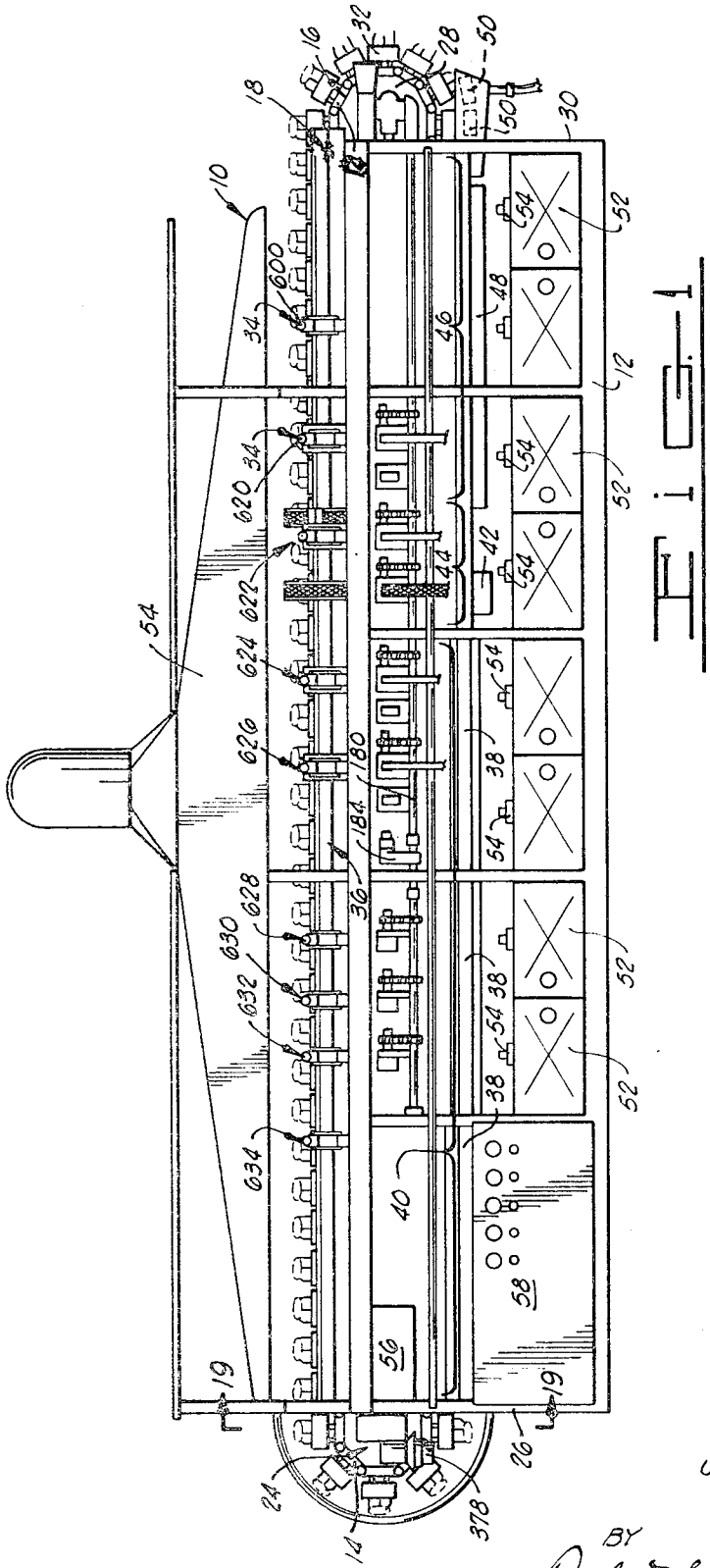


Fig. 1

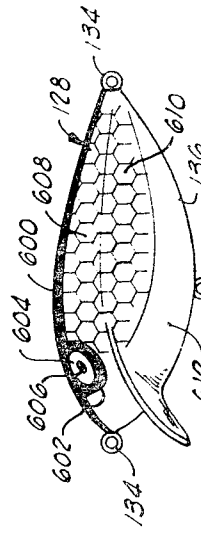


Fig. 2

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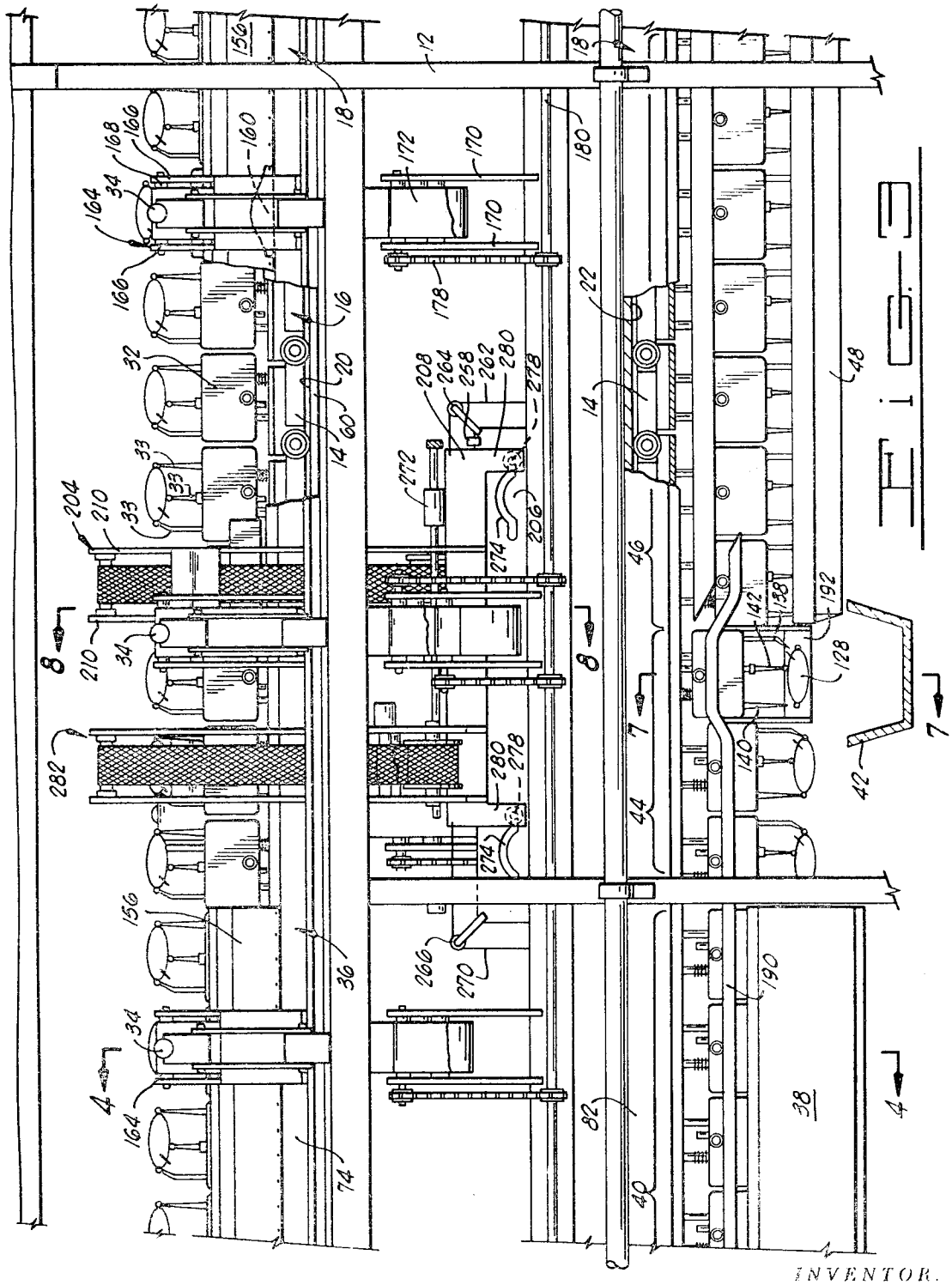


Fig. 3

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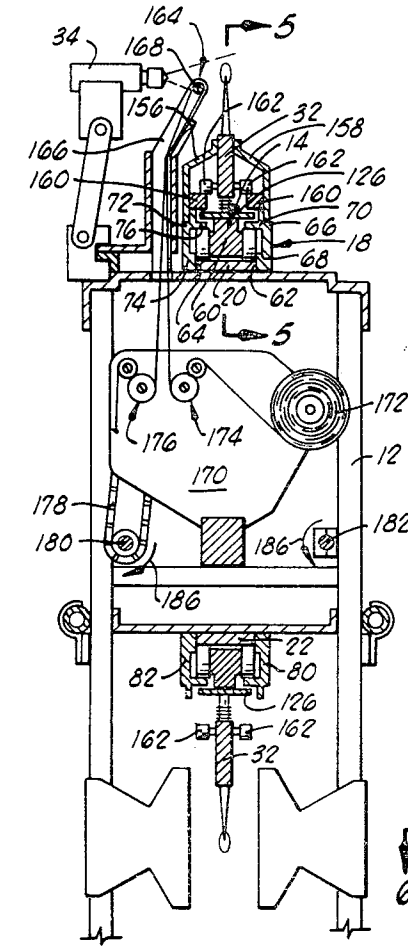


Fig. 4

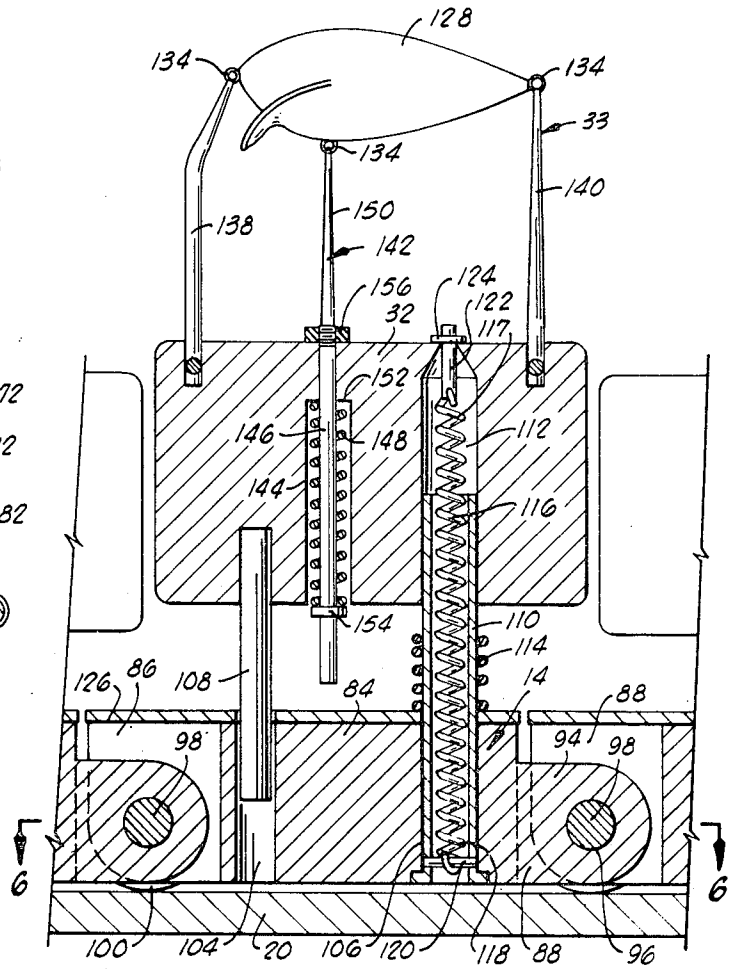


Fig. 5

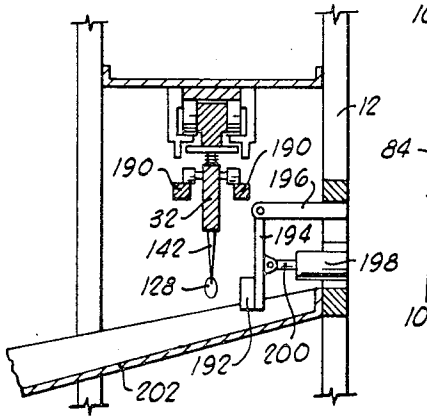


Fig. 7

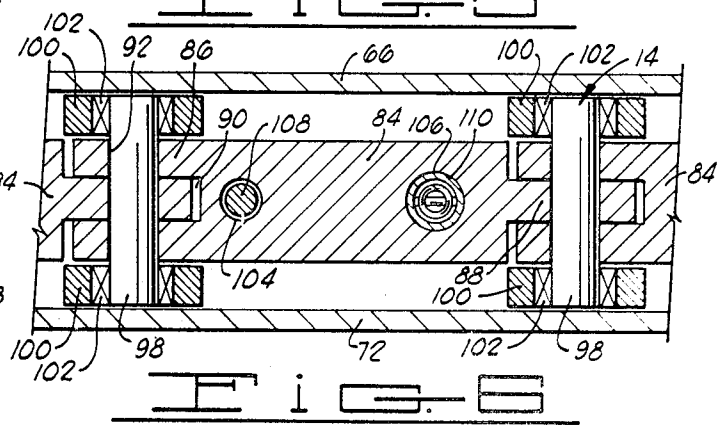


Fig. 6

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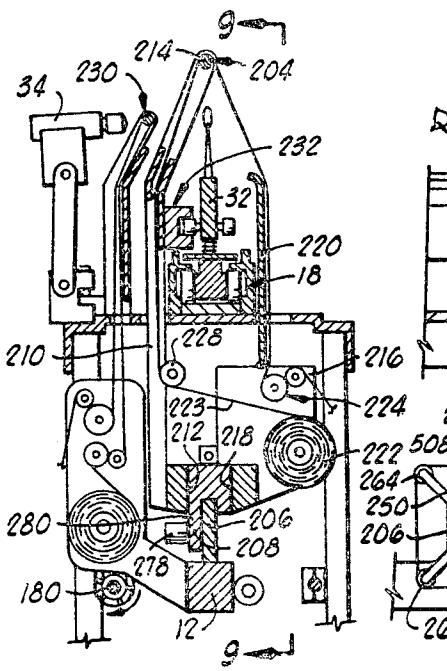


Fig. 8

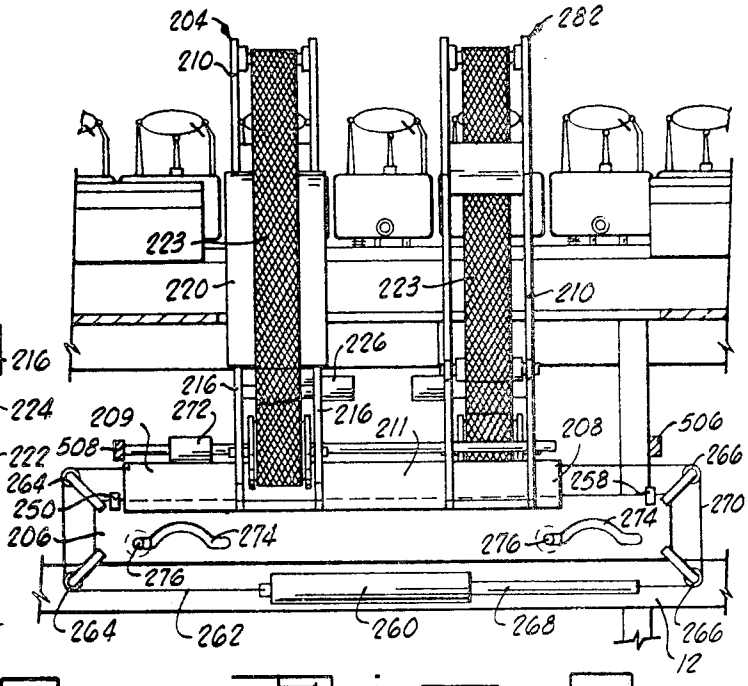


Fig. 9

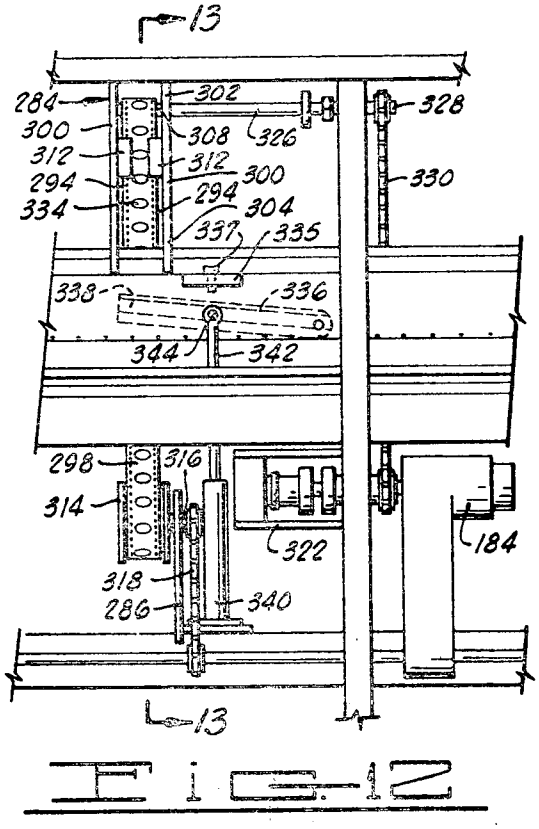


Fig. 12

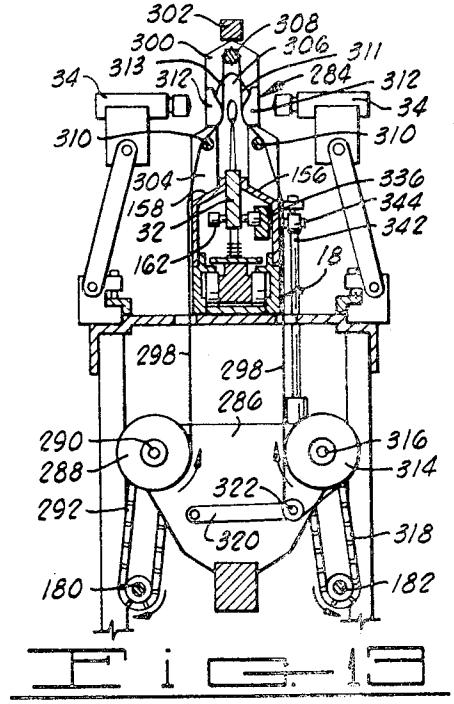
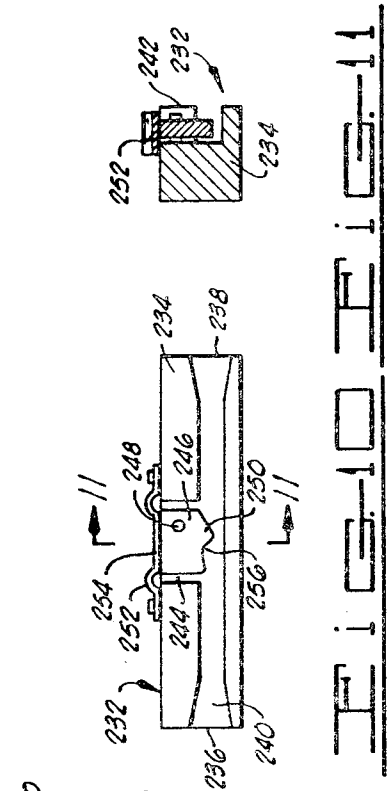


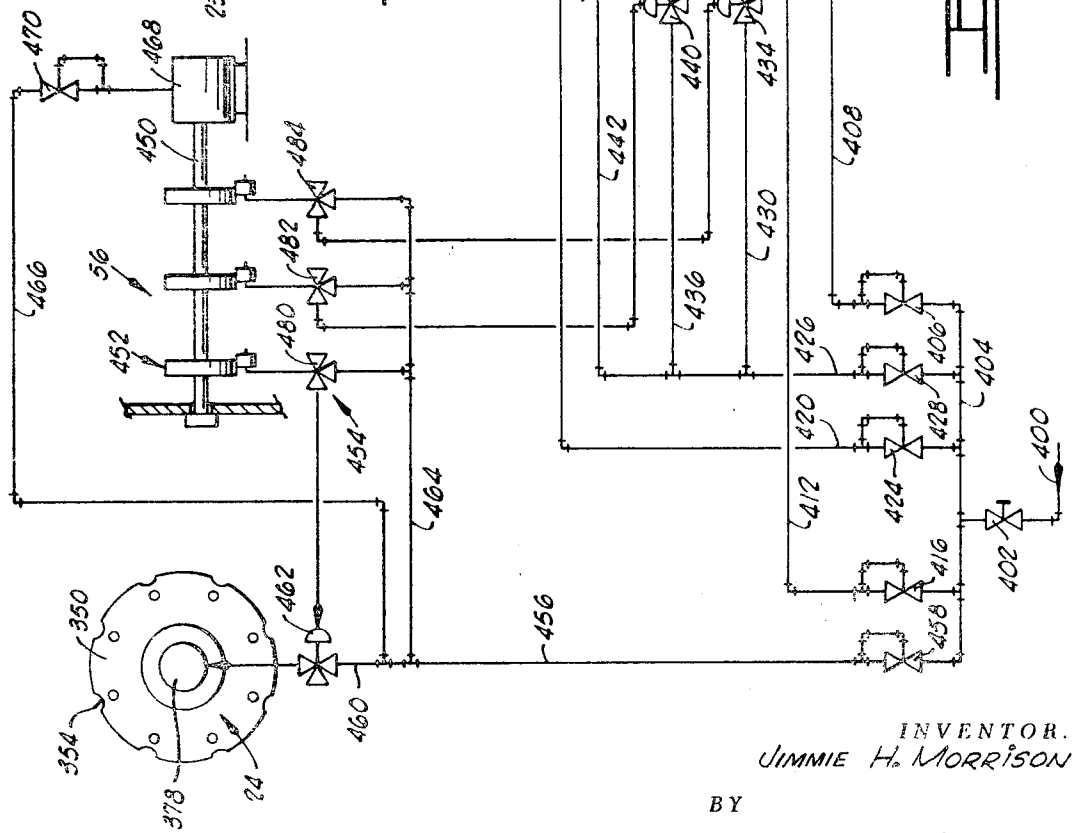
Fig. 13

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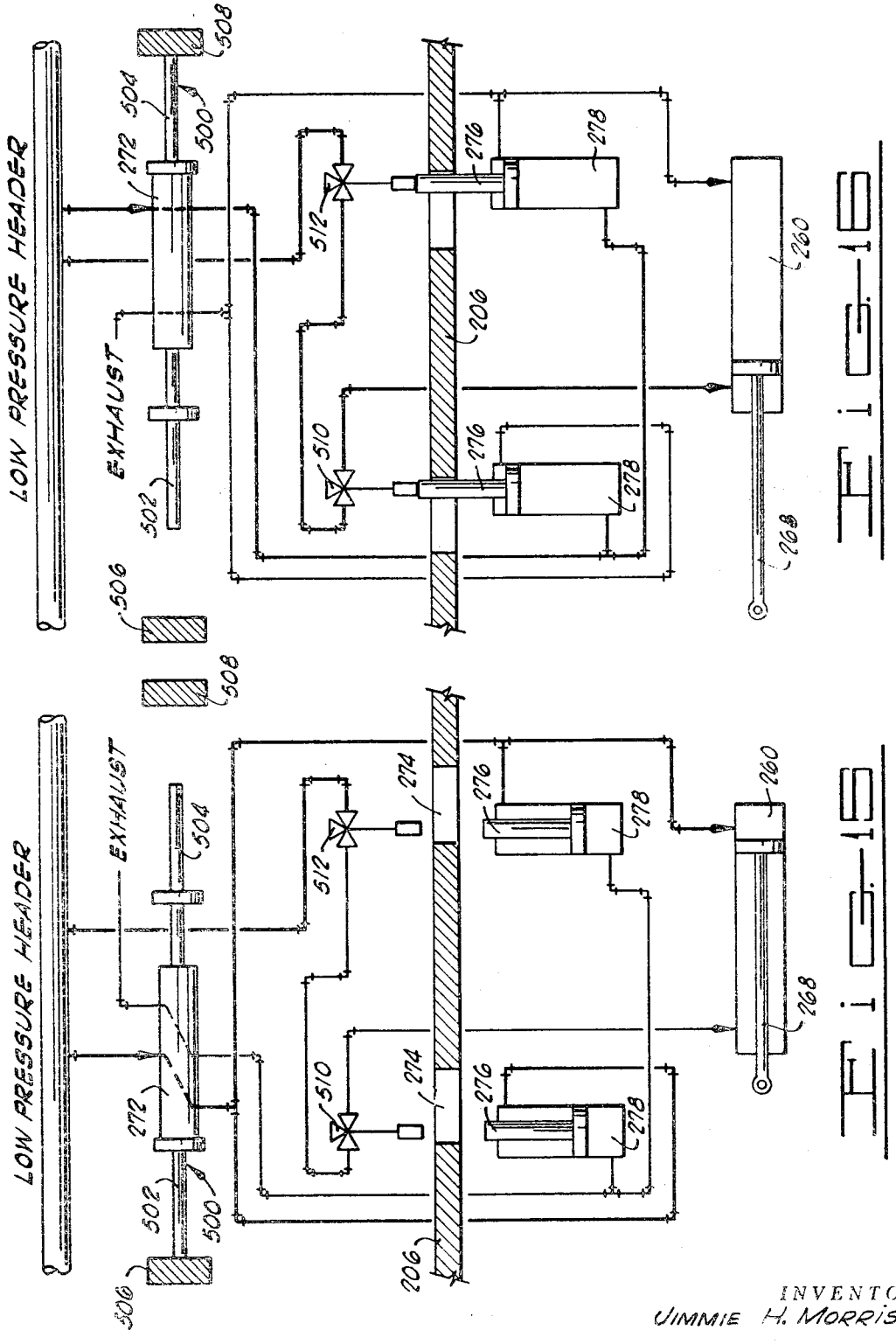


Fig. 15

Fig. 15

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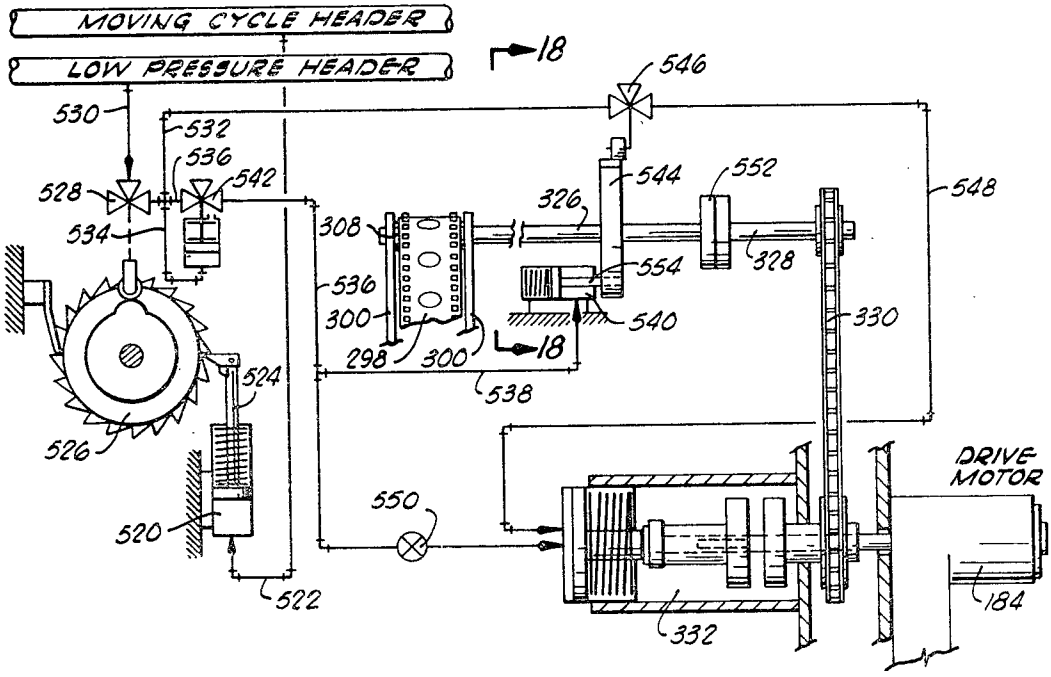
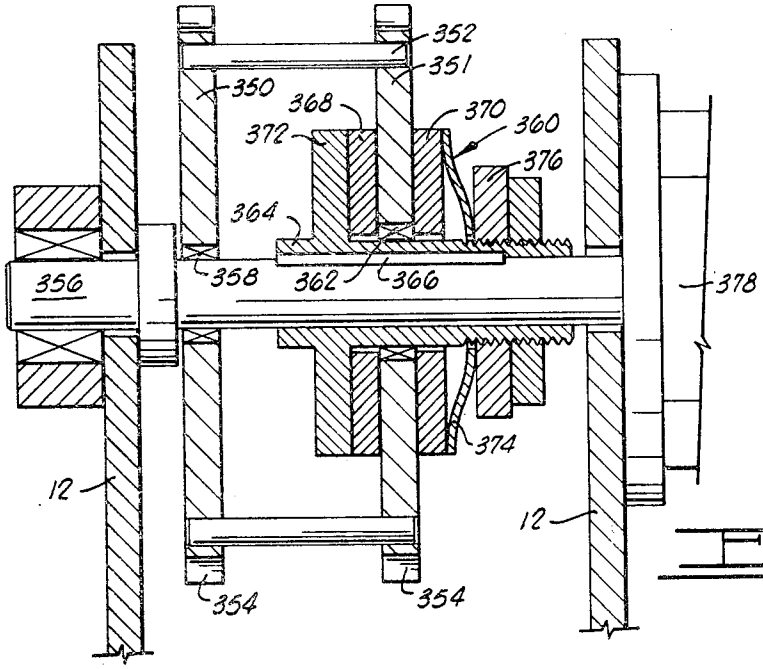


Fig. 17



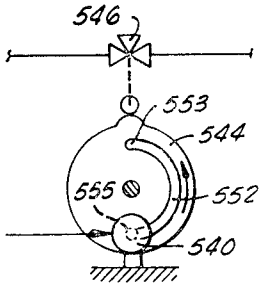


Fig. 18

Fig. 18

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APPARATUS FOR PAINTING ARTICLES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to apparatus for painting articles, and more particularly, but not by way of limitation, to apparatus for painting articles, such as fishing lures and the like, wherein the articles are advanced over a continuous track past means for painting and drying the articles by a continuous chain of carriage members.

2. Description of the Prior Art

Many various types of apparatus have been developed for automatically and continuously painting articles. However, prior to the present invention, apparatus has not been available for painting articles which must be painted with a plurality of different colored paints in specific patterns, and on different areas of the articles.

For example, articles such as fishing lures must be painted with a minimum of two different colors of paint, and the paint must be applied in patterns to simulate the scales and other distinguishing features of fish.

The present invention provides apparatus for automatically and continuously painting articles, such as fishing lures, with a plurality of different colored paints in specific patterns.

SUMMARY OF THE INVENTION

The present invention relates to apparatus for painting articles such as fishing lures and the like which comprises a frame having a continuous elongated track attached thereto. A plurality of carriage members, connected together to form a continuous chain thereof, are movably secured to the track, and means for advancing the chain of carriage members over the track are attached to the frame. Means for supporting the articles to be painted are attached to the carriage members, and means for painting the articles as the articles are advanced along the track are attached to the frame. Means for drying the painted articles, and means for removing the painted and dried articles from the apparatus, are provided.

It is, therefore, a general object of the present invention to provide apparatus for painting articles.

Another object of the present invention is the provision of apparatus for painting articles such as fishing lures and the like, wherein said articles are automatically painted with a plurality of paints of different colors.

A further object of the present invention is the provision of apparatus for painting articles such as fishing lures and the like wherein specific patterns using different colored paints are painted thereon.

Still a further object of the present invention is the provision of apparatus for painting articles such as fishing lures and the like wherein limited areas on the articles may be painted in a variety of colors.

Yet another object of the present invention is the provision of apparatus for painting articles wherein the articles are automatically painted and the paint is automatically dried and baked on the articles.

Still another object of the present invention is the provision of apparatus for painting articles wherein a great number of said articles may be effectively painted and dried in a relatively short time.

Other objects and advantages of the invention will be evident from the following detailed description when read in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the apparatus of the present invention,

FIG. 2 is a view of a fishing lure painted by the apparatus of the present invention,

FIG. 3 is an enlarged view of a portion of the apparatus of FIG. 1,

FIG. 4 is a view in cross section taken along line 4—4 of FIG. 3,

FIG. 5 is a view in cross section taken along line 5—5 of FIG. 4,

FIG. 6 is a view in cross section taken along line 6—6 of FIG. 5,

FIG. 7 is a view in cross section taken along line 7—7 of FIG. 3,

FIG. 8 is a view in cross section taken along line 8—8 of FIG. 3,

FIG. 9 is a view partially in section taken along line 9—9 of FIG. 8,

FIG. 10 is a side view of the latching assembly of FIG. 8,

FIG. 11 is a cross-sectional view taken along line 11—11 of FIG. 10,

FIG. 12 is an enlarged view of a portion of the apparatus illustrated in FIG. 1,

FIG. 13 is a view in cross section taken along line 13—13 of FIG. 12,

FIG. 14 is a view in diagrammatic form of a part of the control apparatus and pneumatic circuitry of the present invention,

FIG. 15 is a view in diagrammatic form of a portion of the pattern painting assembly in a first position and the pneumatic circuitry relating thereto,

FIG. 16 is a view of a portion of the pattern painting assembly and pneumatic circuitry relating thereto in a second position,

FIG. 17 is a view in diagrammatic form of a portion of the limited area painting assembly of the present invention,

FIG. 18 is a view in cross section taken along line 18—18 of FIG. 17, and

FIG. 19 is a view in cross section of the drive and taken along line 19—19 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings and particularly to FIGS. 1 and 3, the apparatus of the present invention is generally designated by the numeral 10. The apparatus 10 basically comprises a frame 12 having a plurality of carriage members 14 supported thereon. Carriage members 14 are connected together to form a continuous chain 16 thereof which is movably secured to a continuous track attached to frame 12, generally designated by the numeral 18. Track 18, which will be further described herein, is basically comprised of a pair of elongated horizontal par horizontal parallel plates 20 and 22 (FIG. 3) rigidly attached to frame 12 one above the other, a drive pulley member 24 rotatably attached to the forward end 26 of frame 12, and an idler pulley member 28 rotatably attached to the rearward end 30 of frame 12. Drive pulley member 24 engages the chain 16 of carriage members 14 and is intermittently rotated so that chain 16 is intermittently advanced over track 18.

A block 32 having a plurality of arms 33 for supporting an article to be painted thereon is secured to each of carriage members 14. The articles to be painted are placed on arms 33 of blocks 32, and are advanced along track 18 by the chain 16.

A plurality of spray painting guns for painting said articles with a plurality of paints of different colors, a plurality of paint shield assemblies, an assembly for painting specific patterns on said articles, and an assemblies for painting limited areas of said articles as said articles are advanced along track 18, are positioned adjacent to and on both sides of a first portion 36 of track 18.

A plurality of electric heaters 38 are positioned adjacent to and on both sides of a second portion 40 of track 18 for drying the articles which have been painted, and for baking the paint onto the articles.

The painted and dried articles are removed from arms 33 of blocks 32 by an assembly positioned adjacent to a third portion 44 of track 18.

While passing over a fourth portion 46 of track 18, the arms 33 of blocks 32 are passed through a body of fluid for removing excess paint therefrom which is confined in a container 48

attached to frame 12. The arms 33 are then passed through a plurality of brushes 50 attached to frame 12, and dried where upon additional lures may be placed thereon.

A plurality of paint storage containers 52 having pneumatic paint stirring devices 54 attached thereto are attached to frame 12.

A hood 54 having an air blower (not shown) attached thereto is attached to frame 12 for removing excess paint from the atmosphere surrounding the apparatus 10.

A pneumatic timer 56 and control panel 58 are attached to frame 12 at the forward end 26 thereof.

Referring now to FIGS. 3 and 4, the first portion 36 of track 18 is comprised of an elongated plate 20 attached to frame 12 in a horizontal plane having a flat top surface 60, and parallel sides 62 and 64. An elongated side member 66, of angular cross section, having a vertical leg 68 and a horizontal leg 70 is attached to side 62 of plate 20. A second elongated side member 72, identical to side member 66, having a vertical leg 74 and a horizontal leg 76 is attached to side 64 of plate 20. Vertical legs 68 and 74 of side members 66 and 72 are attached to plate 20, and the horizontal legs 70 and 76 of side members 66 and 72 face one another.

Portions 40, 44 and 46 of track 18 are comprised of an elongated flat plate 22 identical to plate 20 attached to frame 12 in a horizontal plane directly below plate 20. A pair of elongated side members 80 and 82, identical to side members 66 and 72 are attached to plate 22 in the same manner as described above.

Referring now to FIGS. 4, 5, and 6, each of carriage members 14 basically comprises a bar 84, of rectangular shape in cross section, having a forward end 86 and a rearward end 88. The forward end 86 of bar 84 includes a vertical slot 90 therein, and a bore 92 positioned perpendicularly to slot 90. The rearward end 88 of block 84 is formed in the shape of a vertical tongue 94 having a bore 96 therein of the same diameter as bore 92. Bores 92 and 96 are positioned in bar 84 so that when a plurality of the bars 84 are positioned together in the manner illustrated in FIGS. 5 and 6, with tongues 94 fitted into slots 90, bores 92 and 96 are adjacent to and aligned with each other.

Bars 84 of carriage members 14 are fitted together in the manner described above, and a plurality of shafts 98 are positioned in the bores 92 and 96. A plurality of roller members 100 are secured to the ends of shafts 98, with conventional bearings 102 disposed between the ends of shafts 98 and rollers 100. Thus, a continuous chain 16 of carriage members 14 is formed.

The chain 16 of carriage members 14 is disposed within portions 36, 40, 44 and 46 of track 18, and over drive pulley 24 and idler pulley 28 as illustrated in FIG. 1. The side members 70 and 72 of portion 36 of track 18, and the sides 80 and 82 of the portions 40, 44 and 46 of track 18 hold chain 16 within track 18. As chain 16 is advanced over portion 36 of track 18, rollers 100 roll on the surface 60 of plate 20. As chain 16 is advanced over portions 40, 44 and 46 of track 18, rollers 100 roll on the horizontal legs of side members 80 and 82. As will also be understood, chain 16 is disposed over track 18, drive pulley member 24, and idler pulley member 28 in a tight manner so that there is a minimum of slack in chain 16.

Each of bars 84 of carriage members 14 include a first vertical bore 104 therein, positioned adjacent to the forward end 86 thereof, and a second vertical bore 106, positioned near the rearward end 88 thereof. A block 32 is slidably secured to each of bars 84 by a solid shaft 108 rigidly attached to block 32 and slidably disposed within bore 104, and by a hollow shaft rigidly secured in bore 106 of bar 84 and slidably positioned in a vertical bore 112 of block 32. A spring 114 is disposed over the outside of hollow shaft 110 between bar 84 and block 32. A spring 116 is disposed within shaft 110 and bore 112 of block 32, secured at the lower end 118 thereof to shaft 110 by a pin 120 extending through the sides of shaft 110. The upper end 117 of spring 116 is secured to block 32 by a pin 122 which is in turn secured to the top of block 32 by a conventional washer 124 disposed within a groove in pin 122. Vertical shaft 108 is free to slide in bore 104 of bar 84, and shaft 110 is free to slide within bore 112 of block 32. Thus, it may be seen that each of blocks 32 are free to move in directions perpendicular to the direction of movement of carriage members 14, but are prevented from moving otherwise. Springs 114 and 116 work against each other to maintain blocks 32 in a neutral position a distance from carriage members 14.

As can be seen best in FIGS. 4 and 5, a shield 126 is secured to each of bars 84 of carriage members 14 to prevent paint and dirt from entering the inside of track 18.

A plurality of arms 33 for supporting the articles to be painted by the apparatus of the present invention are attached to each of blocks 32. The number, size and shape of the arms 33 may be varied in accordance with the size and shape of the particular articles to be painted. For purposes of this disclosure, let it be assumed that fishing lures of the shape illustrated in FIG. 2 are to be painted. Referring to FIG. 2, the fishing lures are comprised of a body 128 having metal eyelets 134 disposed therein at the forward end, the rearward end and a lower middle portion thereof. As will be understood, eyelets 134 are used for attaching hooks, etc., to the fishing lure body after it is painted. Referring again to FIG. 3, each of blocks 32 includes a forward supporting arm 138 rigidly attached to block 32, a rearward supporting arm 140 rigidly attached to block 32 and a middle supporting arm 142 slidably secured in a vertical bore 144 extending through block 43. Each of arms 138 and 140 include V-shaped notches at the upper ends thereof (not shown) for receiving forward and rearward eyelets 134 of the fishing lures 128. Arm 142 is comprised of a lower portion 146 extending through bore 144 and an upper portion 150. Upper portion 150 is formed in the shape of a hook at the upper end thereof for engaging middle eyelet 134. Lower portion 146 of arm 142 extends below block 32 to a point near, but not contacting shield 126 when block 32 is in the neutral position described above. A spring 148 is disposed over lower portion 146 of arm 142 within bore 144. The upper end of spring 148 rests against a shoulder 152 formed within bore 144, and the lower end of spring 148 is secured to lower portion 146 of arm 142 by a conventional washer 154 secured in a groove therein. A stop member 156 is secured to arm 142 above block 32. Thus, the lure 128 may be positioned on arms 138 and 140, and arm 134 hooked into middle eyelet 134. The spring 148 allows arm 142 to be raised vertically so that the lure 128 may be placed on arms 138, 140 and 142, and automatically removed therefrom, as will be described further herein.

Referring again to FIGS. 3 and 4, a plurality of identical shield members 156 and 158 are positioned opposite one another and attached to side members 66 and 72 of the portion 36 of track 18. Where it is desirable to move the articles being painted in directions perpendicular to the direction of movement of chain 16, cam members 160 are provided attached to shield members 156 and 158. As can be best seen in FIG. 4, each of blocks 132 includes a pair of cam follower members 162 attached to opposite sides thereof in a plane parallel to track 18. A pair of identical cam members 160 are provided opposite one another at desired points along track 18, positioned so that cam follower members 162 are engaged thereby. As will be understood, the cam surfaces of cam members 160 are formed in a shape which will impart an upward movement to blocks 32 as blocks 32 are advanced along portion 36 of track 18.

Paint Shield Assemblies

Continuing to refer to FIGS. 3 and 4, means for shielding lower portions of the articles being painted are provided by the present invention generally designated by the numeral 164. Each of the shield assemblies 164 basically comprises a pair of parallel arms 166, removably secured to frame 12, and positioned between track 18 and one of spray painting guns

34. A cylindrical roller is rotatably attached to arms **166** at a position between the portion of the article to be shielded and the paint spraying gun **34**. A pair of vertical parallel support plates **170** are attached to frame **12** positioned below arms **166**. A roll of elongated paper **172** is rotatably secured between and to support plates **170**. A conventional paper guide roller assembly **174** is rotatably secured between and to plates **170**, and a conventional paper drive roller assembly **176** is attached between and to support plates **170**. Guide roller assembly **174** includes a conventional spring-loaded friction plate device attached thereto (not shown), so that tension is maintained on the paper advanced therethrough. A drive shaft attached to paper drive assembly **176** extends through one of support plates **170** and a chain drive assembly **178** is attached thereto. A pair of drive shafts **180** and **182** are rotatably attached to frame **12** throughout the length of frame **12**. Drive shafts **180** and **182** are driven by an air motor **184** (FIG. **1**) in opposite directions as indicated by arrows **186** (FIG. **4**). Chain drive assembly **178** is attached to drive shaft **180**. A portion of the paper from roll **172** is threaded through paper guide assembly **174**, over cylindrical roller **168** and through paper drive assembly **176**. Thus, as paper drive assembly **176** is rotated by drive shaft **180**, a supply of paper is continuously advanced over cylindrical roller **168**, and a shield is provided between paint gun **34** and the lower portion of the articles being painted.

Painted Article Removing Assembly

Referring now to FIGS. **3** and **7**, the assembly for removing articles from blocks **32** which have been painted and dried is illustrated. When the chain **16** of carriage members **14** passes over drive pulley member **24** and on to portion **40** of track **18**, the carriage members **14**, blocks **32** and fishing lures painted are in an upside down position. The painted lures are passed over portion **40** of track **18** through a plurality of conventional electric heaters **38**, positioned on both sides of portion **40** of track **18**, thereby drying the paint. The painted and dried lures are then advanced onto portion **44** of track **18**.

A pair of parallel support bars **190**, positioned opposite one another in a horizontal plane are attached to frame **12**. Support members **190** are positioned such that cam members **162** of blocks **32** rest thereon. At a point beneath portion **44** of track **18** support members **190** extend upwardly for a short distance and level off at a position closer to track **18**. Thus, blocks **32** to move closer to carriage members **14**, which in turn causes the lower portions **146** of arms **142** (FIG. **5**) to be contacted by shields **126** of carriage members **14** thereby moving arms **142** towards the lures. That is, as the blocks **32** are moved upwardly by support members **90**, arms **142** are moved downwardly so that the lures are moved away from support arms **138** and **140** as illustrated in FIG. **3**. A bar **192** (FIG. **4**) is pivotally attached to frame **12** at a level adjacent to the lures. Bar **192** is positioned at the point along portion **44** of track **18** where blocks **32** are raised by support members **190**. Bar **192** is attached to a member **194** which is in turn pivotally secured to a horizontal member **196**. Horizontal member **196** is attached to frame **12**. A conventional air cylinder **198** is attached to frame **12**, with the piston arm **200** thereof pivotally attached to member **194**. As each of blocks **32** is raised by support members **190** thereby lowering support arm **142**, bar **192** is moved into contact with the lure by air cylinder **198**. The lure is thereby knocked loose from arm **142**. The lure, thus removed, falls onto a tray **202** from where it slides into a container positioned under tray **202** (not shown). Thus, as each painted and dried lure is advanced over portion **44** of track **18** it is automatically removed from the apparatus **10**.

Pattern Painting Assembly

Referring now to FIGS. **3**, **8** and **9**, the assembly for painting specific patterns on the articles advanced over track **18** is illustrated. Two identical pattern painting assemblies, generally designated by the numerals **204** and **282**, are provided on opposite sides of track **18** so that patterns may be painted on both sides of the articles. Both assemblies **204** and **282** are attached to a carriage member **208** which is slidably secured to an elongated horizontal bar **206**, of rectangular shape, rigidly attached to frame **12** directly below portion **36** of track **18**. The carriage member **208** is slidably supported on the top portion of bar **206** so that carriage member **208** is free to slide in directions parallel to track **18**. Since assemblies **204** and **208** are identical, assembly **204** will be described herein, it being understood that the description applies equally to assembly **282**.

A pair of parallel support arms **210** are attached to carriage member **208** on one side of track **18** to a point about track **18**. A cylindrical roller **214** is rotatably attached between and to arms **210** at the upper ends thereof. A pair of parallel support plates **216** are attached to the side **218** of carriage member **208**, and a vertical plate **220** is attached to the top of parallel support plates **216**. Plate **220** extends upwardly adjacent to the other side of track **18**, opposite from parallel arms **210**, to a point above track **18**. A roll **222** of elongated template material **223** is rotatably attached between plates **216**. The template material **223** if formed in the shape of a specific pattern to be painted on the articles passing over track **18**. In the case where the articles to be painted are fishing lures, template material **223** is formed in the shape of a net so that a pattern simulating scales **2** will be painted on the lures (FIG. **2**).

A conventional drive roller assembly **224** is rotatably secured between and to plates **216**, driven by an air motor **226**. An idler guide roller **228** is rotatably attached between and to parallel support members **210** at a point beneath track **18**. The elongated template material **223** is passed under guide roller **228**, vertically upwards past track **18** and over roller **214**. The template material **223** is then passed over the outside surface of plate **220**, and through drive roller assembly **224**. Thus, as drive roller assembly **24** is rotated by air motor **226**, the template material **223** is advanced over roller **214**.

A spray painting gun **34** is attached to frame **12**, and is positioned at the level of the articles to be painted advanced over track **18**. A paper shield assembly **230**, identical to paper shield assembly **164** previously described, is attached to frame **12** so that it is positioned between spray painting gun **23** and the lower portions of the articles to be painted.

A latching assembly, generally designated by the numeral **232**, is attached to parallel arms **210** at a position above track **18**, so that as each of blocks **32** advances to a point adjacent to latching assembly **232**, one of the cam members **162** thereof is latched into latching assembly **232**.

Referring now to FIGS. **10** and **11**, latching assembly **232** is illustrated. Latching assembly **232** basically comprises a bar **234** of rectangular shape in cross section having a forward end **236** and a rearward end **238**. Bar **234** includes a groove **240** of rectangular shape in cross section in one side **242** thereof, said groove extending from the forward end **236** to the rearward end **238** of bar **234**. A slot **244**, positioned perpendicularly to groove **240** in the side **242** of bar **234** extends upwardly from groove **240**. A lathing member **246** is pivotally secured in slot **244** by a bolt **248**. The lower end **250** of latching member **246** extends into groove **240**, and a spring member **252** is disposed over the upper end **254** of latching member **246** so that a force must be applied to latching member **246** in order for it to be pivoted. The lower end of latching member **246** includes a notch **256** therein.

Referring again to FIG. **8**, latching assembly **232** is attached to parallel arms **210**, and positioned so that as each of blocks **32** is advanced to a point adjacent the rearward end **238** of block **234**, one of cam members **162** attached to the blocks **32** will enter groove **240**. As the block **32** is advanced further, cam member **162** will come into contact with latching member **246** causing latching member **246** to be pivoted in a counter clockwise direction. When the cam member **162** enters notch **256** of latching member **246**, it will become latched in notch **256** by the force applied to latching member **246** by spring **252**. Thus, as each of blocks **32** are advanced along

track **18**, one of cam members **162** thereof will be latched into latching assembly **232**. Therefore, carriage member **208** and the apparatus attached thereto will tend to advance forwardly with each of blocks **32**.

Referring now to FIG. **9**, an air cylinder **260** is attached to frame **12** below bar **206**. A first cable **262** is attached to air cylinder **260**, and is disposed over a pair of rollers **264** which are attached to bar **206**. The other end of cable **262** is attached to the rearward end **209** of carriage member **208**. A second cable **270** is attached to the forward end **211** of carriage member **208**, and is disposed over a pair of rollers **266** attached to bar **206**. The other end of cable **270** is attached to the piston arm **268** of air cylinder **260**. Thus, as piston arm **268** of air cylinder **260** is moved in one direction, carriage member **208** and the apparatus attached thereto will be moved in the opposite direction, and vice versa.

Air cylinder **260** is provided to move carriage member **208** and the apparatus attached thereto forwardly simultaneously with each of the blocks **32** latched into latching assembly **232**. Air cylinder **260** also moves carriage member **208** back to its original position after carriage member **208** has been advanced with each block **82**. A mechanically actuated air relay **272**, which will be described further herein, is attached to carriage member **208** for actuating air cylinder **260**.

The force of air cylinder **260** moving carriage member **208** rearwardly causes each of the blocks **32** to be unlatched from latching assembly **232**.

In order to provide movement to carriage member **208**, the apparatus attached thereto, and each of blocks **32**, in directions perpendicular to the direction of movement of the chain **16**, a pair of slots **274** are provided in bar **206**. Slots **274** are identical, and are shaped to provide movement in a direction perpendicular to track **18** to a pair of cam followers **276** when said cam followers **276** are extended therethrough. As can best be seen in FIG. **3**, cam followers **276** are the piston arms of a pair of conventional air cylinders **278**, which are attached to a pair of vertical arms **280** attached to carriage member **208**. Cam followers **276** are inserted into slots **274** by air cylinders **278** just prior to the forward movement of carriage member **208**. As carriage member **208** is moved forwardly, carriage member **208** and the apparatus attached thereto, including the block **32** latched into latching assembly **232**, are simultaneously moved upwardly as cams **276** pass over the surfaces of slots **274**. Upon reaching a forward stop **258** attached to bar **206**, the cam members **276** are retracted from slots **274**, and carriage member **208** and the apparatus attached thereto is moved by air cylinder **260** horizontally rearwardly to a position against rearward stop **259** attached to bar **206**.

As will be understood, pattern painting assemblies **204** and **282** are moved past spray painting guns **34** simultaneously with the article being painted so that the paint is continuously shielded from the article by template material **223**, and the desired pattern is painted thereon. By shielding lower portions of the article with shield assemblies **230**, and raising and lowering the article as it is moved forwardly, a pattern formed in the shape of an arc will result such as is illustrated on the lure **128** of FIG. **2**.

Limited Area Painting Assemblies

Referring now to FIGS. **12** and **13**, one of the limited area painting assemblies attached to frame **12** is illustrated, and is generally designated by the numeral **284**. Assembly **284** is comprised of a support plate **286** attached to frame **12** at a position below track **18** in a vertical plane perpendicular to track **18**. A roller **288** of template material **298** is rotatably secured to plate **286**, and is connected to a drive shaft **290** extending therethrough. A drive chain assembly **292** is connected to drive shaft **290** and to drive shaft **180** previously described. A conventional friction plate assembly (not shown) is disposed between drive shaft **290** and roller **288**.

A pair of parallel plates **300** are attached to frame **12** at the upper ends **302** thereof above track **18**, and are attached to shield members **158** and **156** of track **18** at the lower ends **304** thereof. Plates **300** are positioned in vertical planes perpendicular to track **18**, and each includes an elongated vertical opening **306** therein so that blocks **32** and the articles to be painted supported thereon may be passed through openings **306**. The elongated template material **298** is provided with a plurality of equally spaced holes **294** therein along each of the sides thereof. A cylindrical drive roller **308**, having a set of teeth at each end around the periphery thereof for engaging the holes **294** in template material **298**, is rotatably secured between plates **300** at the upper ends **302** thereof. A pair of guide rollers **310** are rotatably secured between plates **300** on opposite sides of the openings **306**, and a pair of guide plates **312** are attached to each of plates **300** above guide rollers **310**. A spool **314** for receiving template material **298** is rotatably secured to plate **286** on the opposite side from roller **288**. Spool **314** is connected by a drive shaft **316** to a drive chain assembly **318** which is in turn connected to drive shaft **182**, previously described. An elongated bar **320** is pivotally attached to plate **286** at one end, and an idler roller **322** is rotatably attached to the other end thereof.

The template material **298** is passed from roll **288**, over one of guide rollers **310**, under guide plates **312** on one side of the plates **300**, and over roller **308**. From roller **308** the template material **298** is passed under the second pair of guide plates **312** on the other side of the plates **300**, over the other guide roller **310**, under guide roller **322** and onto reel **314**. Guide plates **312** function to hold portions **311** and **313** of template material **298** vertically parallel to each other.

Drive roller **308** is connected to a drive shaft **326**. Drive shaft **326** is connected to a cam **544**, which will be described further herein. Cam **544** is connected by a drive shaft **328** to a drive chain assembly **330**. Drive chain assembly **330** is connected to a conventional pneumatic clutch assembly **332**, which is in turn connected to drive motor **184**.

As drive roller **308** is rotated, the template material **298** is advanced over drive roller **308**. As template material **298** is advanced roller **288** is turned clockwise against a friction plate assembly which is being turned counterclockwise by chain assembly **292**. Thus, template material **298** is continuously maintained in tension between roller **288** and drive roller **308**. As the template material **298** is advanced, slack between drive roller **308** and reel **316** is taken up by idler roller **322** which is free to move upwardly and downwardly. Reel **314** is turned counterclockwise by drive chain assembly **318** at a slower rate than template material **298** is advanced. However, tension is maintained on the portion of template material **298** between idler roller **322** and drive roller **308** by the weight of idler **322**.

A pair of spray painting guns **34** are attached to frame **12**, and are positioned adjacent to portions **311** and **313** of template material **298**.

Template material **298** includes plurality of openings **334** therein, formed in the shape of the limited area to be painted on the articles advanced over track **18**. Assuming again that fishing lures are being painted, the openings **334** in template material **298** are in circular form for painting the outline of an eyeball on each side of the lures. As will be understood, three limited area painting assemblies are used for painting eyes on fishing lures, i.e., one for the eyeball outline, one for the eyeball itself, and one for the eye pupil.

The distance between the openings **334** in the template material **298** is coordinated with the amount of template material **298** advanced over drive roller **308** so that a pair of the openings **334** are always positioned opposite one another in the portions **311** and **313** of template material **298** adjacent to spray painting guns **34**.

As will be described further herein, template material **298** is advanced by drive roller **308** once each time **20** articles have been painted. That is after **20** articles have been painted through template material **298**, fresh template material is positioned between spray painting guns **34** and the articles being painted.

In order to accurately position each article to be painted between the portions **311** and **313** of template material **298** at the level of spray guns **34** and aligned openings **334**, a bar **336** is pivotally attached to the inside of shield **156**. The bar **336** includes a groove **338** extending throughout the length of bar **336** for engaging a cam member **162** of each of blocks **32** as blocks **32** are advanced over track **18**. A conventional air cylinder **340** is attached to frame **12** having the piston arm **342** thereof attached to bar **336** by a bolt **344** which extends through a slot (not shown) in shield member **156**. Thus, as each of blocks **32** is advanced to a point adjacent spray guns **34** and stopped, air cylinder **340** raises bar **336** thereby raising the block **32** upwardly. Thus, the article to be painted is raised upwardly between the portions **311** and **313** of template material and between spray painting guns **34**. A bar **335** is attached to shield member **156** on the outside thereof, positioned above piston arm **242** of air cylinder **340**. A bolt **337** threadedly secured in a vertical bore in bar **335** is adjusted to limit the travel of piston arm **342** and the height to which the article to be painted is raised. Spray painting guns **34** are activated after the article to be painted is raised without portions **311** and **313** of template material **298** so that paint is sprayed onto the template material and through the openings **334** of the template material thereby painting a limited area on both sides of the article.

Drive Apparatus

As previously described, an air motor **184** is provided for driving drive shafts **180** and **182**. Drive shafts **180** and **182** are used to advance the paper supply over the paper shield assemblies attached to apparatus **10**, to advance the template material in the pattern painting assemblies, etc. Drive motor **184** is also used to rotate drive roller **308** of the limited area painting assemblies described above. This aspect of the limited area painting assemblies will be described further herein.

Referring to FIGS. **1** and **19**, the chain **16** of carriage members **14** is advanced over track **18** by drive pulley member **24**. As will be described further herein, chain **16** is advanced intermittently. That is, chain **16** is repeatedly advanced a specific distance and stopped.

Drive pulley member **24** is comprised of a pair of parallel circular plates **350**, (FIG. **19**) held apart by a plurality of shafts **352** attached between and to the plates **350**. As can best be seen in FIG. **14**, each of plates **350** includes a plurality of notches **354** around the periphery thereof. The plates **350** are positioned together so that the notches **354** therein are positioned adjacent one another. The notches **354** are spaced around the periphery of the plates **350**, and are of a size so that the rollers **100** of the chain **16** of carriage members **14** are engaged by notches **354** as drive pulley member **24** is rotated.

Referring again to FIG. **19**, plate **350** is rotatably secured to shaft **356** by conventional bearing member **358**. Plate **351** is rotatably secured to a slip clutch assembly **360** by conventional bearing **362**. Slip clutch assembly is comprised of a sleeve **364** which is rigidly held on shaft **356** by key **366**. A pair of opposed friction plates **368** and **370** are disposed over sleeve **364** on opposite sides of plate **351**. Friction plate **368** is held adjacent to plate **351** by the flange **372** of sleeve **364**. Friction plate **370** is held against the other side of plate **351** by a spring **374** which is forced against friction plate **370** by a circulate plate **376** threadedly secured on sleeve **364**. Thus, the friction plate assembly **360** may be adjusted by threading plate **376** inwardly towards plate **351** thereby increasing the spring tension against friction plate **370**, and vice versa. Shaft **356** is rotatably secured to frame **12** and is attached to an air-operated drive motor **378**. Thus, the slip clutch assembly **300** of drive pulley member **24** prevent the apparatus **10** from being damaged if claim **16** becomes caught along track **18** when air motor **378** is rotating shaft **356**.

Control Apparatus and Pneumatic Circuitry

Referring now to FIG. **14**, the apparatus and associated pneumatic circuitry for intermittently advancing and stopping chain **16**, controlling spray painting guns **34**, the painting assemblies, etc., is illustrated. A supply of compressed air at a pressure of approximately 200 pounds is led through conduit **400**, through a conventional shutoff valve **402** into a conduit **404**. A conduit **408** is connected to conduit **404** and to a header **410**. A conventional pressure regulator **406** is disposed within conduit **408**. Header **410** is positioned along the length of apparatus **10**, and is attached to each of paint containers **52** (FIG. **1**) by individual conduits (not shown). Pressure regulator **406** is set to control the pressure in header **410** and within each of paint containers **52** at approximately 20 to 40 p.s.i.g. As will be understood, pressure is maintained on each of containers **52** in order to force paint out of paint containers **52** into spray guns **34** through hoses (not shown).

A conduit **412** is connected to conduit **404** and to a header **414**. A conventional pressure regulator **416** is disposed within conduit **412**. Each of pneumatically driven paint-stirring devices **54** attached to paint containers **52** are connected to header **414** by hoses (not shown). Pressure regulator **416** is adjusted to maintain the pressure in header **414** at a level which will efficiently operate paint stirring devices **54**.

A conduit **420** is connected to conduit **404** and to a header **422** which is attached to frame **12** of apparatus **10**. A pressure regulator **424** is disposed within conduit **420**. Pressure regulator **424** is set to maintain a high pressure of approximately 100 p.s.i.g. in header **422** which is used as a source of high-pressure air for continuously operating high-pressure spray guns if used on apparatus **10**.

A conduit **426** is connected to conduit **404** having a pressure regulator **428** disposed therein. Pressure regulator **428** is set to maintain a relatively low pressure such as **80** p.s.i.g. in conduit **426**. A conduit **430** is attached to conduit **426** and is attached to a header **432**. Header **432** is attached to frame **12** of apparatus **10** throughout the length of frame **12** and is used to activate spray guns and other painting assemblies on apparatus **20** during the periods when chain **16** of carriage members **14** is stopped. A control valve **434** for intermittently exhausting the air from header **432**, and pressuring up header **432** is disposed in conduit **430**.

A conduit **436** is attached to conduit **426** and is attached to a header **438**. Header **438** is attached to frame **12** throughout the length of frame **12**, and is used to activate spray painting guns **34**, and other painting assemblies attached to apparatus **10** during the periods when chain **16** is being advanced over track **18**. A conventional control valve **440** is disposed within conduit **436** for intermittently exhausting and pressuring up header **438**.

A conduit **442** is attached to conduit **426** and attached to a header **444**. Header **444** is attached to frame **12** along the length of frame **12** and is used as a source of low pressure air for operating low pressure spray painting guns and other painting apparatus attached to apparatus **10**.

Timer **56**

Referring still to FIG. **14**, timer **56** is illustrated in diagrammatic form. Timer **56** is basically comprised of a shaft **450** having a plurality of circular cam members **452** attached thereto. A conventional cam actuated pilot valve **454** is positioned adjacent to each of cam members **452**. Cam members **452** and pilot valves **454** are of a conventional type wherein pilot valves **454** may be in an open position or a closed position for any desired length of time during one revolution of the shaft **450**.

A conduit **456** is attached to conduit **404**, and a conventional pressure regulator **458** is disposed therein. Pressure regulator **458** is set to maintain a pressure of approximately 80 p.s.i.g. in conduit **456**. A conduit **460** is attached to conduit **456** for leading a supply of air to drive motor **378** attached to drive pulley member **24**. A control valve **462** is disposed in

conduit **460** for intermittently starting and stopping the flow of air to air motor **378**. A conduit **464** is connected to conduit **456** for conducting a supply of air to each of pilot valves **454**.

A conduit **466** is connected to conduit **456** for conducting a supply of air to drive motor **468**. A conventional pressure regulator **470** is disposed in conduit **466** for adjusting the speed of drive motor **468**. Drive motor **468** is a conventional air operated motor and is attached to shaft **450** for rotating shaft **450**. All of the pressure regulators described above and related conduits are disposed within control panel **58** attached to from **12** of apparatus **10**. Air filters, air heaters, oilers, etc., are also provided where required.

A pilot valve **480** is connected to control valve **362**. When pilot valve **480** is in the open position air is supplied to control valve **462** which in turn allows air to pass through conduit **460** to drive motor **378**. Drive motor **378** rotates drive pulley member **24** and advances chain **16**. When pilot valve **480** is in the closed position, control valve **462** is closed thereby exhausting the air from air motor **378** and stopping drive pulley member **24** and chain **16**.

Pilot valve **482** is connected to control valve **440**. When pilot valve **484** is in the open position control valve **444** allows air to pass into header **438** thereby pressuring up header **438**. When pilot valve **484** is in the closed position, control valve **440** will close, exhausting the air from header **438**.

Pilot valve **486** is connected to control valve **434** so that when pilot valve **486** is open, header **432** will be pressured up, and when pilot valve **486** is closed, control valve **434** will close exhausting the air from header **432**.

Timer **56** is set to control the apparatus **10** in two cycles each of a 2-second duration as follows:

Pilot Valve	Cycle I Status	Result
480	Open	Air motor 378 energized and chain 16 is advancing.
482	Open	Header 438 is pressured up.
484	Closed	Header 432 is exhausted.
	Cycle II	
480	Closed	Air Motor 378 is deenergized and chain 16 is stopped.
482	Closed	Header 438 is exhausted.
484	Open	Header 432 is pressured up.

During cycle I the articles to be painted are being advanced past spray painting guns which are activated by air pressure from the Moving Cycle Header **438**. During cycle II, the articles are stopped, and certain spray painting guns and painting assemblies are activated by air pressure from the Stop Cycle Header **432**, such as the limited area painting assemblies.

As will be understood, additional cams and pilot valves may be provided in timer **56** for individually controlling spray painting guns or any other pneumatically controlled aspect of the painting assemblies described above. Also, timer **56** may be set to control apparatus in different cycles from those described above.

Pattern Painting Assembly

Referring now to FIGS. **15** and **16**, the control apparatus and pneumatic circuitry associated with the pattern painting assembly is shown in diagrammatic form. As previously described, air cylinders **278** are attached to carriage member **208** which slides over bar **206**. Air cylinder **260** is attached to frame **12** and moves carriage member **208** forwardly with each of blocks **32** as they are advanced along track **18**, and moves carriage member **208** rearwardly when the blocks **32** are stopped.

Air relay **272**, previously described, includes an elongated actuating arm **500** extending therethrough having a forward end **502** and a rearward end **504**. When carriage member **208** has been moved to the forward position, the forward end **502** of arm **500** contacts a stop **506** attached to frame **12**, and the arm **500** is moved rearwardly (FIG. **15**). A supply of air, conducted to relay **272** from the low pressure header **444** previously described, is conducted through relay **272** to each of air cylinders **278** causing cam members **276** to be retracted from slots **274** of bar **206**. Air is simultaneously supplied to air cylinder **260** which will move piston arm **268** rearwardly, simultaneously moving carriage member **208** to the rearward position.

When carriage member **208** is moved to the rearward position, the rearward end **504** of arm **500** is contacted by a stop **508** attached to frame **12** causing arm **500** to be moved forwardly. The supply of air conducted to relay **272** will then be supplied to the other ends of air cylinders **278** causing cam members **276** to be inserted into slots **274** of bar **206**. A pair of mechanically actuated pilot valves **510** and **512** are provided adjacent cam members **276** so that when cam members **276** are extended through slots **274**, pilot valves **510** and **512** are opened. Once both of pilot valves **510** and **512** are opened, air is supplied to the other end of air cylinder **260**, thereby causing air cylinder **260** to move carriage **208** forwardly with cam members **276** extended into slots **274**.

Pilot valves **510** and **512** insure that air cylinder **260** is not energized and carriage member **208** moved forwardly until both of cam members **276** have been inserted through slots **274**.

Thus it may be seen that air cylinder **260** is energized and ready to move carriage member **208** forwardly each time the blocks **32** are advanced by chain **16**. When the blocks **32** are advanced, air cylinder **260** moves carriage member **208** forwardly and over the cam surfaces of slots **274** in bar **206** simultaneously. As soon as carriage member **208** reaches the forward position, air cylinder **260** moves carriage member **208** horizontally rearwardly so that latching assembly **232** is latched on to the next of blocks **32**.

Limited Area Painting Assemblies

Referring now to FIGS. **17** and **18**, the control apparatus associated with each of the limited area of painting assemblies described above is illustrated in diagrammatic form. A spring loaded pneumatic cylinder **520** is attached to frame **12** and connected to the moving cycle header **438** by a conduit **522**. Thus, air pressure is supplied to air cylinder **520** during each moving cycle and piston arm **524** is moved upwardly. Each time piston arm **524** of air cylinder **520** is moved upwardly it engages a ratchet-type cam **526** rotatably attached to frame **12**. A normally closed cam follower actuated pilot valve **528** is positioned adjacent to cam **526** with the cam follower thereof riding on cam **526**. Cam **526** is provided with **20** teeth which are engaged by arm **524** of air cylinder **520** so that cam **526** is moved one 360° revolution and pilot valve **528** is opened once every 20 cycles.

Pilot valve **528** is connected to a low pressure header **444** by a conduit **530**, and when pilot valve **528** is in the open position, air is conducted through pilot valve **528** into conduits **532**, **534** and **536**.

Conduit **536** is connected to conventional pneumatic clutch assembly **332**, previously mentioned, which is in turn connected to drive motor **184**. A conduit **538** is connected to conduit **536** and to a spring-loaded air cylinder **540**. A normally open time delay valve **542** is disposed in conduit **536**, and conduit **534** is connected to the actuator of time delay valve **542** which is arranged so that after a short period of time, the air pressure exerted on actuator **534** will cause time delay valve **542** to be closed.

A cam member **544** is attached to shaft **326** which is in turn attached to drive cylinder **308** for advancing the template material **298** of the limited area painting assemblies, previ-

ously described. A cam-actuated pilot valve **546** is positioned adjacent to cam member **544** with the cam follower thereof riding on cam **544**, and conduit **532** is connected thereto. A conduit **548** is connected to pilot valve **546** and to pneumatic clutch assembly **332**. A check valve **550** is disposed in conduit **536** so that air pressure is prevented from backflowing through conduit **536** from pneumatic clutch assembly **332**. Cam member **544** is connected to chain drive assembly **330** by shaft **338** which has a conventional friction plate assembly **552** disposed therein.

Referring to FIG. **16**, cam member **544** includes a semicircular slot **552** disposed in the side thereof facing air cylinder **540**. Air cylinder **540** is positioned adjacent to cam member **544** so that when the piston arm **554** thereof is extended it may enter slot **552**. When piston arm **554** of air cylinder **540** is in the retracted position, cam **544** is extended with cam member **544** rotating in the direction indicated by the arrow (FIG. **16**), piston arm **544** will enter slot **552** at the forward end **553** thereof, and slide along slot **552** until it reaches the rearward end **555** thereof, whereupon cam **554** will be prevented from rotating further until piston arm **554** is again retracted. The cam surface of cam **554** is formed in a shape which will cause pilot valve **546** to be closed when cam **544** is stopped by piston arm **554**.

In operation, pilot valve **528** is activated by cam **526** once every 20 cycles. That is, after chain **16** has been advanced and stopped 20 times, pilot valve **528** will be opened. When pilot valve **528** is opened, air passes through conduit **530** from low pressure header **444** into the conduits **532**, **536** and **534**. Since time delay valve **542** is normally open air will be conducted by conduit **536** through check valve **550** into the pneumatic clutch assembly **532**, and through conduit **538** into air cylinder **540**. Pneumatic clutch assembly **532** will be activated so that drive motor **184** is connected to chain drive assembly **330**, rotating shaft **328**. At the same time piston arm **554** of air cylinder **540** will be retracted from slot **552**, allowing shaft **326** to be rotated. As cam member **554** and shaft **326** are rotated, time delay valve **542** will close, and conduits **536** and **538** will be exhausted. Thus, piston arm **554** of air cylinder **540** will be moved forwardly, but since cam member **554** has been rotated, piston arm **554** will rest on the smooth surface of cam member **44** adjacent to slot **552**. Due to the initial rotation of cam member **544**, pilot valve **546** will be in the open position, and air pressure will be supplied through conduit **548** to pneumatic clutch assembly **332**. Thus, cam member **544** and shaft **326** will continue to rotate and piston arm **540** will ride against the smooth surface of cam **544** until slot **552** is moved to a point adjacent piston arm **554**. Piston arm **554** will then drop into the forward end **553** of slot **552**, and as cam member **544** is rotated further, piston arm **554** will slice in slot **552**, to the rearward end **555** of slot **552**. Thus, when one full rotation of cam **554** has been completed, cam **544** will be stopped. At the same time pilot valve **546** will be closed by cam **544**, exhausting air from pneumatic clutch assembly **332** so that chain drive assembly **330** is disengaged from drive motor **184**. Thus, it may be seen that drive cylinder member **308** may be rotated one complete revolution or a number of revolutions each time chain **16** has been advanced and stopped 20 times thereby advancing a fresh supply of template material over drive cylinder **308**.

OPERATION

Let it be assumed that the articles to be painted are fishing lures of the type illustrated in FIG. **2**. The fishing lures are manually placed on the supporting arms **33** of each of blocks **32** in the manner described above as chain **16** of carriage members **14** are advanced over track **18**. As described above, the chain **16** is repeatedly advanced a specific distance and stopped. As chain **16** is advanced (cycle I) the Moving Cycle Header is pressured up within, and the Stop Cycle Header is exhausted. When chain **16** is stopped (cycle II) the Moving Cycle Header is exhausted and the Stop cycle Header is pressured up. The spray painting guns **34**, operated intermittently, are positioned along track **18** so that the fishing lures to be painted are stopped just prior to the spray painting guns, and advanced past the spray painting guns before they are again stopped. The intermittent spray painting guns **34** are controlled with air from the moving cycle header so that paint is sprayed therefrom only during cycle I. The limited area painting assembly spray painting guns are activated during cycle II by air pressure from the Stop Cycle Header.

Referring to FIG. **2**, let it be assumed that a plurality of fishing lures of the type illustrated are to be painted as follows: a black stripe **600** across the top, a black eyeball outline **602**, a silver eyeball **604**, a black pupil **606**, a red stripe **608** below the black stripe **600** with a black scale pattern thereon, a silver stripe **610** below the red stripe **608** with a white scale pattern thereon, and a white stripe **612** below the silver stripe **610**.

To carry out the painting of the lures in the above manner, the following paint guns and other painting assemblies are positioned along track **18** as shown in FIG. **1** in the order given.

1. A spray painting gun **620** on each side of track **18** for painting each lure white all over.

2. A spray painting gun and paper shield assembly **622** on each side of track **18** for painting a block stripe on the top one-third portion of each lure.

3. A pattern painting assembly **622** for painting the top two-thirds of each side of each lure silver in a scale pattern. As will be understood, the scales are painted and the scale outlines are not so that the scale outlines on the top one-third of each lure are black, and the scale outlines in the middle portion of each lure are white.

4. A spray painting gun and a paper shield assembly **624** on each side of track **18** for painting a red stripe over the silver scales on the top one-third of each side of each lure. A transparent red paint is used which will cover the silver paint already on each lure, but which will allow the black scale outlines to show through.

5. A spray painting gun and a paper shield assembly **626** on each side of track **18** for painting a black stripe across the top of each side of each lure. A set of cams **160** are provided for raising each lure as it is advanced past assemblies **626** thereby causing the black strip painted thereon to be formed in the shape of an arc.

6. A limited area painting assembly **628** for painting a black eyeball outline on each side of each lure.

7. A limited area painting assembly **630** for painting a silver eyeball on each side of each lure.

8. A limited area painting assembly **632** for painting a black pupil on each side of each lure.

9. A spray painting gun **634** on each side of track **18** for painting each lure all over with a protective clear paint.

The painted lures are advanced over portion **40** of track **18** where the paint is dried and baked onto the lures. The lures are removed from the apparatus as they are advanced over portion **44** of track **18**, and excess paint is removed from the arms **33** of each block **32** while being advanced over portion **46** of track **18**.

The apparatus of the present invention can paint from 8,000 to 12,000 lures in an 8-hour time period in the colors and patterns described above.

As will be understood, a plurality of any small identical articles may be painted with a variety of colored paints in variety of selected patterns by the apparatus of the present invention.

The present invention, therefore, is well adapted to carry out the objects and attain the ends and advantages mentioned as well as those inherent therein. While presently preferred embodiments are given for the purpose of disclosure, numerous changes in the details of construction of parts can be made which will readily suggest themselves to those skilled in the art and which are encompassed within the spirit of the invention disclosed herein.

What is claimed is:

1. Apparatus for painting articles such as fishing lures and the like, which comprises:

a frame having a continuous elongated track attached thereto;

a plurality of carriage members connected together to form a continuous chain thereof movably secured to said track;

means for advancing said chain of carriage members over said track attached to said frame;

means attached to each of said carriage members for supporting an article to be painted thereon, said supporting means comprising:

a block of rectangular shape slidably attached to said carriage member so that said block may be moved in a direction perpendicular to the direction of movement of said chain of carriage members;

eyelets attachable to the forward, rearward and middle portions of each article to be supported;

a first arm rigidly attached to said block supporting an eyelet attachable to the forward portion of an article to be supported on said supporting means;

a second arm rigidly attached to said block for supporting one of said eyelets attachable to the rearward portion of an article to be supported by said supporting means;

a third arm slidably attached to said block and having one end formed in the shape of a hook for engaging an eyelet attachable to a middle portion of one of said articles to be supported on said supporting means; and

resilient means for urging said third arm toward said block attached to said third arm and attached to said block whereby said article may be rigidly supported by said first and second arms;

means for painting said articles as said articles are advanced along said track attached to said frame;

means for drying said painted articles attached to said frame; and

means for removing said painted and dried articles from said apparatus attached to said frame.

2. Apparatus for painting articles such as fishing lures and the like, which comprises:

a frame having a continuous elongated track attached thereto;

a plurality of carriage members connected together to form a continuous chain thereof movably secured to said track;

means for advancing said chain of carriage members over said track attached to said frame;

means attached to each of said carriage members for supporting an article to be painted thereon, said supporting means comprising:

a block of rectangular shape of slidably attached to said carriage member so that said block may be moved in a direction perpendicular to the direction of movement of said chain of carriage members; and

means for rigidly holding said article to be painted attached to said block;

means for painting said articles as said articles are advanced along said track attached to said frame;

means attached to said frame for painting specific patterns on each of said articles as said articles are advanced along said track, said means for painting specific patterns comprising:

a spray painting gun rigidly attached to said frame and positioned perpendicularly to a portion of said track at a level adapted for alignment of said spray painting gun with articles to be painted as they are advanced over said track;

a support member slidably attached to said frame below the level of said spray painting gun so that said support member is free to move in a direction parallel to the direction of movement of said articles;

a pair of parallel arms attached to said support member and adapted to extend between said spray painting gun and articles supported on said article supporting means;

a cylindrical roller rotatably attached to said pair of arms at a position above the level of said spray gun;

a supply of elongated template material attached to said support member, said template material being formed in a pattern to be painted on said articles, and being disposed over said cylindrical roller so that a portion thereof is positioned between said spray painting gun and said articles;

latching means attached to said support member for latching said support member to each of said blocks as said blocks are advanced over said portion of said track thereby causing said support member and template material to be simultaneously advanced past said spray gun with each of the articles being painted so that said pattern is painted on said articles; and

means for causing said latching means to be unlatched from each of said blocks after the respective block has advanced past said spray painting gun, and for returning said support member to a position whereby it may be advanced past said paint spraying gun with the next of said blocks;

means for drying said painted articles attached to said frame; and

means for removing said painted and dried articles from said apparatus attached to said frame.

3. The apparatus of claim 2 which is further characterized to include means attached to said support member for periodically advancing said template material over said cylindrical roller.

4. The apparatus of claim 2 which is further characterized to include means for shielding the lower portion of each of said articles painted disposed between said spray painting gun and said template material.

5. The apparatus of claim 4 wherein said means for shielding the lower portion of each of said articles painted comprises:

a cylindrical roller rotatably attached to said frame and positioned between the lower portion of said articles being painted and said spray painting gun;

a supply of elongated paper attached to said frame having a portion thereof disposed over said roller; and

means for periodically advancing said paper over said roller attached to said frame.

6. The apparatus of claim 2 which is further characterized to include means for simultaneously moving said article being painted and said template material in directions perpendicular to said track as said article being painted and said template material are advanced past said spray painting gun.

7. The apparatus of claim 6 wherein said means for simultaneously moving said article being painted and said template material in directions perpendicular to said track comprises:

a cam member attached to said frame having a cam surface which will impart movement in directions perpendicular to said track to a cam follower when said cam follower is advanced in a direction parallel to said track;

a cam follower member slidably secured to said cam surface of said cam member;

said support member being attached to said cam follower member so that when said support member is moved forwardly with said block, said support member, said template material, said block and said article are simultaneously moved in directions perpendicular to said track.

8. Apparatus for painting an article such as fishing lures and the like, which comprises:

a frame having a continuous elongated track attached thereto;

a plurality of carriage members connected together to form a continuous chain thereof movably secured to said track;

means for advancing said chain of carriage members over said track attached to said frame;

means attached to each of said carriage members for supporting an article to be painted thereon, said article supporting means comprising:

a block of rectangular shape slidably attached to said carriage member so that said block may be moved in a direction perpendicular to the direction of movement of said chain of carriage members; and

means for rigidly holding said article to be painted attached to said block;

means for painting said articles as said articles are advanced along said track attached to said frame;

means attached to said frame for painting limited areas on both sides of said articles as said articles are advanced along said track, said limited area painting means comprising:

a pair of spray painting guns attached to said frame and adapted for spraying paint at the level of articles along said track, said spray painting guns being positioned on opposite sides of said track perpendicularly to said track and facing each other;

a cylindrical roller rotatably attached to said frame at a position above the level of said spray painting guns and between said spray painting guns;

a supply of elongated template material attached to said frame, said template material having a plurality of openings therein formed in the shape of the areas to be painted on said articles, and being disposed over said cylindrical roller so that portions thereof having said openings therein are disposed on both sides of said articles between said articles and said spray painting guns;

means for stopping said chain of carriage members from advancing along said track as each article to be painted is advanced to a point adjacent said template material and said spray guns;

means for causing said spray painting guns to spray paint on said template material and the respective article aligned with said template material when said chain of carriage members is stopped; and

means for starting said chain of carriage members after each article has been painted;

means attached to said frame for drying said painted articles; and

means attached to said frame for removing said painted and dried articles from said apparatus.

9. The apparatus of claim 8 which is further characterized to include means for periodically advancing said template material over said cylindrical roller so that fresh template material is periodically positioned on both sides of said article between said article and said spray painting guns.

10. Apparatus for painting articles such as fishing lures and the like which comprises:

a frame having continuous elongated track means attached thereto;

a plurality of carriage members connected together to form a continuous chain movable carried by said track means;

means attached to said frame for advancing said chain of carriage members over said track means;

means attached to individual ones of a plurality of said carriage members for supporting an article to be painted thereon, said means comprising:

a block movably mounted on said carriage member for movement in a direction perpendicular to the direction of movement of said chain of carriage members on said track; and

means attached to said block for holding an article to be painted, said article holding means comprising:

first arm means attached to said block for supporting a leading portion of an article to painted rigidly above said block;

second arm means attached to said block for supporting a trailing portion of said article to be painted rigidly above said block;

third arm means adapted for engagement with a middle section of said article to be painted between said leading and trailing portions, said third arm means being slidably attached to said block; and

resilient means attached to said third arm means and to said block for urging said third arm means toward said block to hold an article to be painted rigidly supported on said first arm means and said second arm means; and

means attached to said frame for painting said articles as said articles are advanced along said track means

11. Apparatus for painting articles such as fishing lures and the like which comprises:

a frame having a continuous elongated track attached thereto;

a plurality of carriage members connected together to form a continuous chain thereof movably secured to said track;

means attached to said frame for advancing said chain of carriage members over said track;

a block slidably attached to each one of a plurality of said carriage members so that each of said blocks may be moved in a direction perpendicular to the direction of movement of said chain of carriage members on said track;

means attached to each of said blocks for holding thereon an article to be painted;

means attached to said frame for painting said articles as said articles are advanced along said track;

means attached to said frame for painting specific patterns on each of said articles as said articles are advanced along said track, said means for painting specific patterns comprising:

a spray painting gun attached to said frame and positioned perpendicularly to a portion of said track for painting articles advanced over said track;

a support member slidably attached to said frame below the level of said spray painting gun so that said support member is free to move in a direction parallel to the direction of movement of said articles to be painted;

a pair of parallel arms attached to said support member extending between said spray painting gun and the path of articles during painting;

a cylinder roller rotatably attached to said pair of arms at a position above the level of said spray gun;

a supply of elongated template material attached to said support member, said template material being formed in the pattern to be painted on said articles, and being disposed over said cylindrical roller so that a portion thereof is positioned between said spray painting gun and said articles;

latching means attached to said support member for latching said support member to each of said blocks as said blocks are advanced over said portion of said track thereby causing said support member and template material to be simultaneously advanced past said spray gun with each of said articles being painted so that said pattern is painted on said articles; and

means for causing said latching means to be unlatched from each of said blocks after said block has advanced past said spray painting gun, and for returning said support member to a position whereby it may be advanced past said spray painting gun with the next of said blocks.

* * * * *

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(5/69)

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,633,536 Dated January 11, 1972

Inventor(s) Jimmie H. Morrison

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In column 2, line 46, "par horizontal" should be deleted.

In column 4, line 29, "block 43" should be --block 32--.

In column 6, line 13, after "208 on" insert --one side 212 thereof ıpport arms 210 extend upwardly adjacent to--.

In column 6, line 27, "2" should be omitted after "scales."

In column 6, line 43, painting gun "23" should be -34--.

In column 6, line 58, "lathing" should be --latching--.

In claim 2, line 48, delete the word "of" before the ɔrd "slidably."

In claim 10, line 47, "movable" should be --movably--.

In claim 11, line 43, "cylinder roller" should be -cylindrical roller--.

In column 9, line 18, "242" should be --342--.

In column 10, line 41, "20" should be --10--.

In column 13, line 16, after "cam 544 is", insert --free to rotate. However, when piston arm 554 is--.

Signed and sealed this 18th day of July 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents