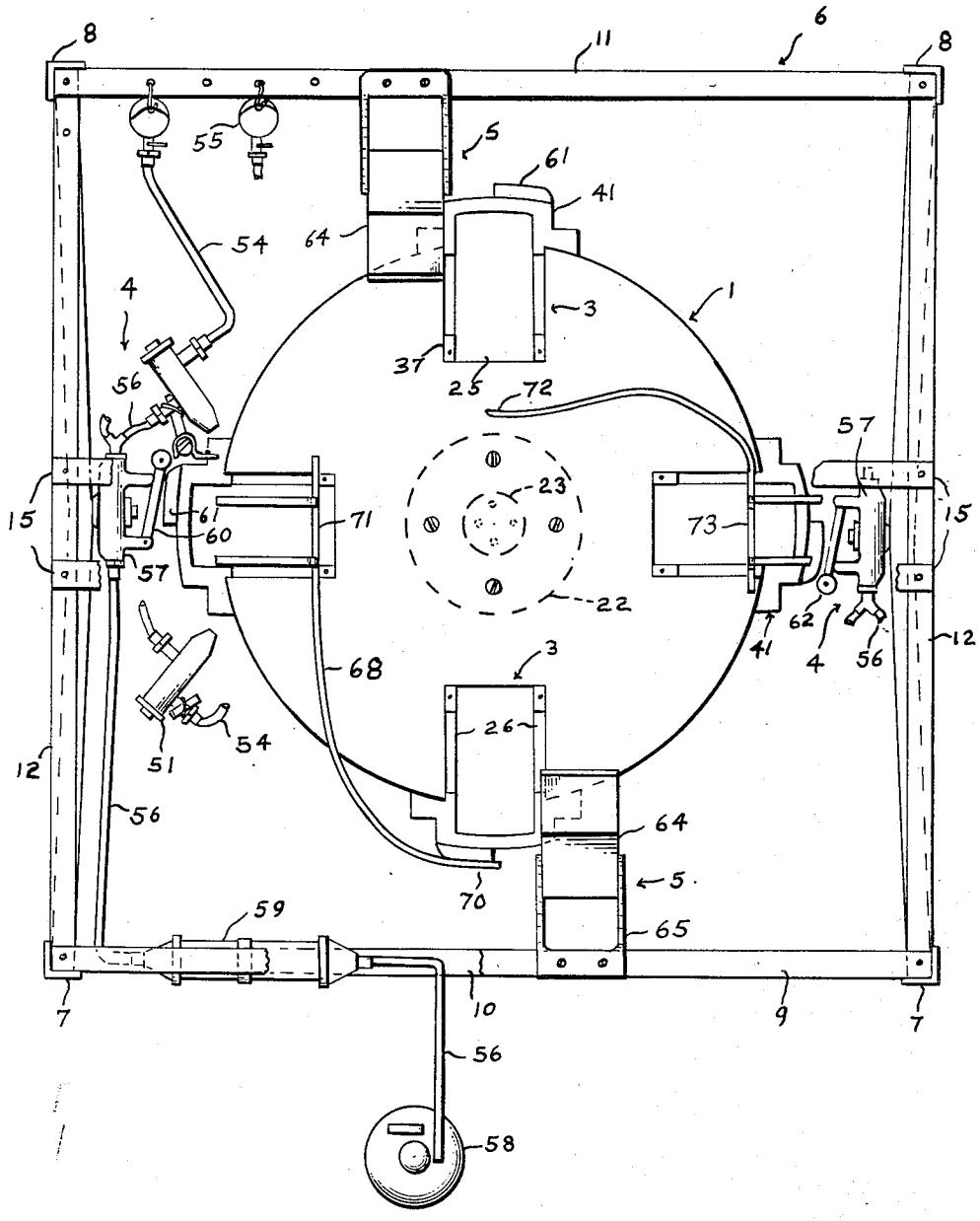
March 5, 1957 B. LA GOY 2,783,708

PAINT SPRAYING MACHINE

Filed Sept. 9, 1953 3 Sheets-Sheet 1

Fig 1



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PAINT SPRAYING MACHINE

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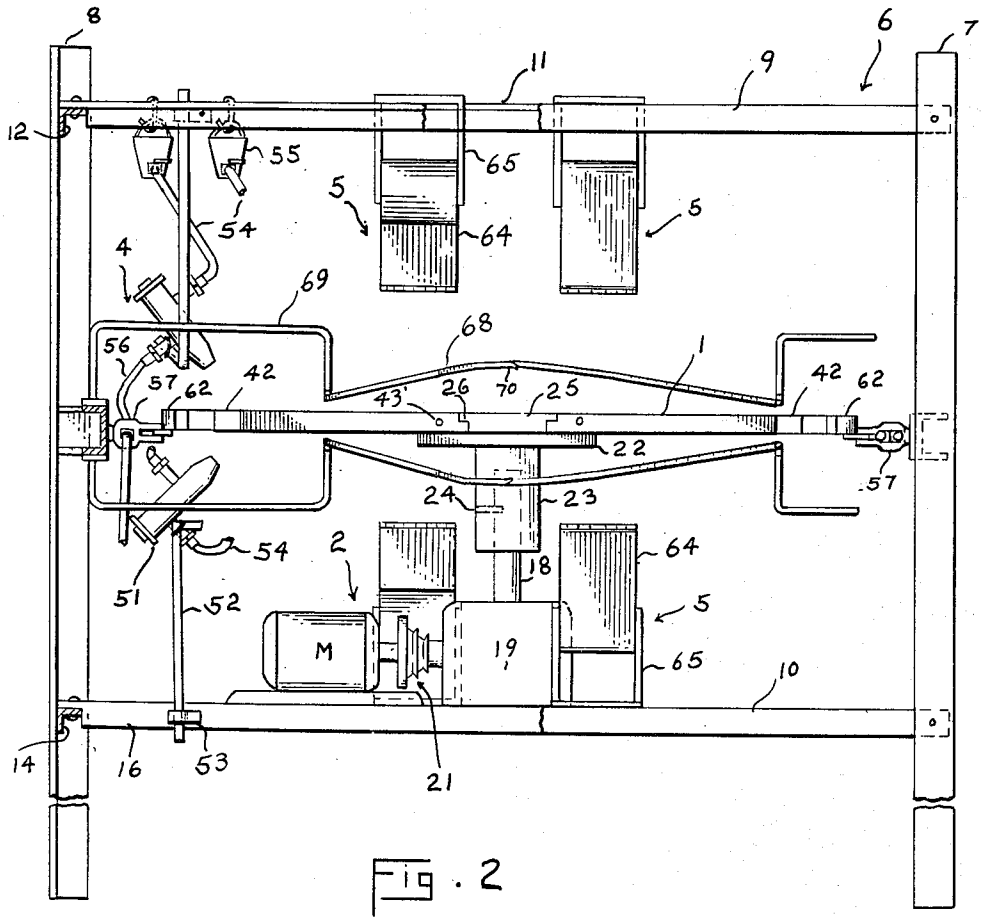


Fig. 2

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March 5, 1957 B. LA GOY 2,783,708

PAINT SPRAYING MACHINE

Filed Sept. 9, 1953 3 Sheets-Sheet 3

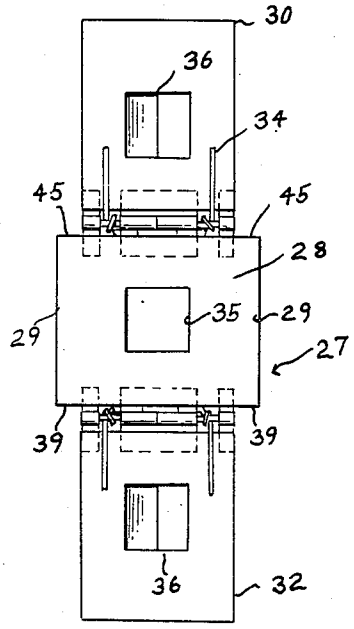


Fig. 6

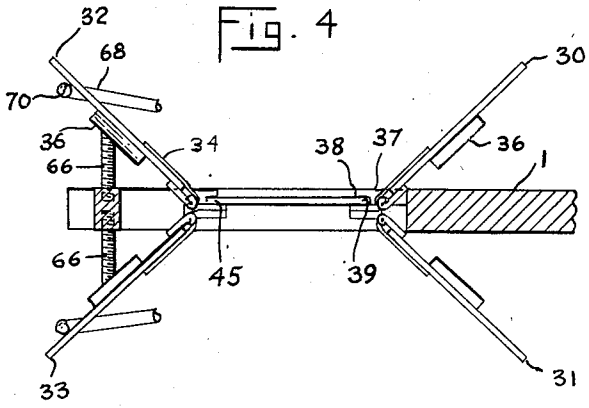


Fig. 4

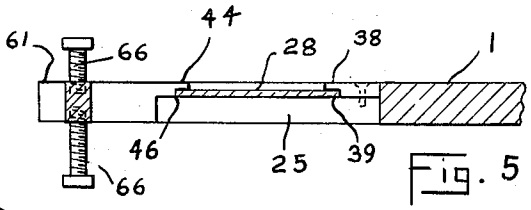


Fig. 5

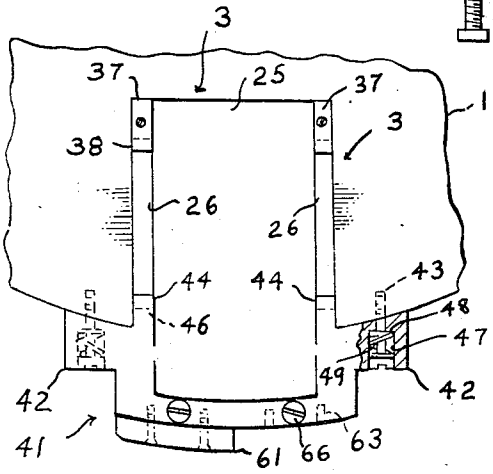


Fig. 3

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2,783,708

PAINT SPRAYING MACHINE

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Application September 9, 1953, Serial No. 379,227

7 Claims. (Cl. 101—115)

My invention relates to new and useful improvements in paint spraying machines of the turntable type, and it has for its general object the provision of an economical, labor and time saving paint spraying machine of the turntable type.

A further object of the invention is the provision of a turntable paint spraying machine whereby an article may be sprayed with a variety of colors with a minimum of labor and in a single revolution of the table.

The machine comprises a rotatable turntable about which is alternately positioned a plurality of paint spraying and drying stations whereby different portions of an article may be alternately painted and dried as it is carried by a single revolution of the table through the various stations.

A feature of the invention lies in the provision of a stencil whereby certain portions of an article are exposed at different times in the revolution of the turntable to the spraying action of paint guns at the different paint stations.

Another feature is in an attachment to the table whereby a stencil adapted to support an article to be painted may be held in place in the table and when desired readily removed and replaced by another stencil with a minimum of effort.

A further feature of the invention lies in means for automatically manipulating a stencil carried upon the table so as to cover certain portions of an article on the stencil prior to the article being carried through a paint station.

A still further feature of the invention is means associated with the turntable for automatically operating pre-set guns above as well as below the table at a pre-set point during the rotation of the table.

The invention, though subject to wide application, finds particular use in the spay painting of plastic novelties. The latter may take as many forms as the imagination may conjure, and consequently each item will have its own stencil cut out to accommodate the particular article.

The invention further lies in the general organization and arrangement of the various elements of the machine as well as in their cooperative association with one another.

The foregoing objects and features of the invention, as well as others, together with the various advantages of the invention will become readily apparent as this specification proceeds in further detail and as it is read in conjunction with the acompanying drawings.

In the drawings, wherein a paint spraying machine embodying the invention is disclosed,

Fig. 1 is a top plan view of the machine with some portions cut away to better disclose the invention;

Fig. 2 is a front elevational view with some portions cut out to further clarify the invention;

Fig. 3 is an enlarged detail of one of the stencil supporting places of the table;

Fig. 4 is a longitudinal cross section through Fig. 3,

but disclosing a stencil positioned in the supporting place;

Fig. 5 is a view similar to Fig. 4, but with only a marginal section of the base plate of the stencil in position; and

Fig. 6 is a top plan view of the stencil.

In describing the invention in further detail reference is directed to the several drawings, wherein there is disclosed a turntable 1 provided with suitable drive means 2 and including a plurality of article supporting places 3. The table is circular and is adapted for rotatable movement when activated by the drive means. When rotated, the table serves to carry articles borne by the supporting places through paint spraying stations 4 and paint drying stations 5. The drive means, paint spraying and drying stations are supported by the cross bars of the framework of an open structure 6.

The frame structure 6 is substantially square and includes an upright 7 at each front corner thereof and a similar upright 8 at each of the rear corners. The uprights are connected to one another by a plurality of cross bars. Connecting the uprights at the front of the framework is an upper cross bar 9 and a lower bar 10. Connecting the rear uprights is a cross bar 11 at the top, and a similar one near the bottom, not shown. Connecting the front to the rear uprights at the right and left sides of the framework are upper side bars 12 and lower bars 14. Bars 12 are bridged to one another across the middle of the framework by a pair of neighboring bars 15; the lower bars 14 are bridged by a similar pair of bars 16, of which one is partially shown.

The turntable comprises a large table disposed in a horizontal position and axially supported for rotation upon a shaft 18 connected by a suitable reduction gear box 19 and variable drive means 21 to a motor M. The gear box and motor combination are of a type intended for providing and controlling variable speeds of rotation of the turntable. There is secured to the underside of the turntable a disc plate 22 which in turn is bolted to a shaft 23 of greater diameter relative to the shaft 18. The latter is received in a bore axially of the thicker shaft 23 and is secured therein in suitable manner such as by a pin 24. The heavy shaft 23 and disc plate 22 serve to provide added support to the central area of the table, preventing distortion and wobbling which would otherwise occur were there a direct connection between the table and the slender shaft 18.

Each article supporting place 3 in the table comprises a rectangular section 25 cut out to the outer edge of the table. The cutout section includes at opposite sides thereof a ledge or shoulder 26 which supports a stencil member, generally designated 27 which serves to support the article that is to be subjected to the paint spraying process.

The stencil member (Figs. 4–6) comprises a base plate 28 adapted to rest at its side marginal edges 29 upon the shoulders 26 of a cutout section. The plate carries at opposite ends a pair of stencil leaves of narrower width than the base plate and slightly narrower than the width of the opening of the cutout 25. The pair of leaves located at one end of the plate are designated 30 and 31, while the pair at the opposite end are numbered 32 and 33. Each pair of leaves is hinged to the base plate and they are so arranged that when the marginal sides of the base plate rest on the shoulders 26, a leaf at each end, namely leaves 30 and 32 will pivot above the table, while leaves 31 and 33 will pivot below the table. The base plate is provided with springs 34 arranged so as to constantly tension the leaves out and away from the base plate.

The base plate has a cutout 35 in which an object, not

shown, is adapted to be supported in such manner that a part of it is exposed above the plate and part below. The stencil leaves are intended to fold over the object. Stencil openings 36 are provided in the leaves and are adapted to expose certain portions of the surface of the object so that only these portions will be coated with paint as the object is carried through a paint station.

It is to be understood that the configuration of the cutout 35 in the base plate 28 is for purposes of illustration. This particular cutout may accommodate a plastic novelty in such manner that the latter will protrude in part above and in part below the base plate. An example of such an object would be the head of a baby's rattle, not shown, prior to its being assembled to a handle. The rattle head is formed of a pair of opposed shells welded together. A slight thin web or rib formed along the seams of the shells is sufficient to overlie the edges of the base plate adjacent the cutout 35 so as to support the rattle head in the latter. A pair of pins temporarily inserted into opposite sides of the rattle head so that the external portions thereof will rest upon the edges of the cutout may also be used as a means of supporting the object in the cutout.

Besides a rattle head, the cutout may accommodate in similar manner various other articles; for example, a compact case, a plastic toy Easter egg; a pillow form rotor of a child's revolving toy, and others.

Suitable means is provided for removably securing the stencil member 27 in a cutout section 25 of the table. To this end, there is provided a lug 37 removably secured at the rear upon each ledge 26 of the cutout. Each lug has a tongue portion 38 which overhangs the rear marginal edge 39 of the base plate, so that the base plate may not be lifted free of the cutout at its rear. The cutout section is also provided with a handle element 41 (Fig. 3), which spans the open end thereof and also serves to secure the base plate in place in the cutout section 25. The handle is removably secured across the open end of the cutout section of the table, and to this end there is provided at the end of each arm of the U-shaped handle an extension 42 through which a bolt 43 extends and is engaged in a threaded hole 43 in the periphery of the table. Tongues 44 at the extremities of the arms of the handle project over the shoulders 26 of the cutout 25 and are designed to overhang the outer marginal edge 45 of the stencil base plate, whereby the front end of the latter is held in place. A shoulder 46 formed by each tongue abuts against the outer edge of the base plate 28 so as to further secure the position of the latter in the table cutout.

Here, there is provided in the turntable four cutout sections 25 in each of which a stencil member 27 may be supported. Each cutout section is provided with a handle element 41, and is 90 degrees apart from its neighbor.

It is to be noted that the outer portion 47 of each bore of the handle element 41 in which a securing bolt 43 is contained is enlarged and provides a shoulder 48 at the inner end of the bore. About the outer shank of the bolt is a spring 49 which is contained in the bore and limits between the shoulder 48 and the head of the bolt. An advantage of this characteristic of the handle is provided when it is desired to remove the stencil member 27 from the table cutout and to replace it with another. To remove member 27, the handle element 41 is manually pulled against the tension of the bolt springs 49 away from the table sufficiently to remove the tongues of the handle from the edge of the base plate. The latter is thereupon drawn free of the overhang of the lugs 37 and is lifted from the table. In replacing the member 27, the rear edge of the base plate is slid under the overhang of the lugs 37 and the marginal sides of the base plate are rested upon the shoulders 26 of the cutout. The handle is then released and allowed to be tensioned in place by its bolt springs with the tongues of the handle overhanging the base plate and the shoulders of the tongues abutting against the front edge of the base plate.

An unpainted article carried on the base plate 28 of a member 27 supported in the table is subjected to a plurality of operations as the turntable is rotated through a complete revolution. The article is carried alternately through paint spraying and drying stations until it reaches the point or place of beginning, where it is removed and replaced with another unpainted article.

A paint spraying station 4, of which there are two, one substantially diametrically opposite the other, comprises air pressure spray guns 51 of conventional make, supported in suitable manner at desired positions about the turn table so that when actuated they will spray paint on certain portions of an article carried by the base plate 28 of a member 27. The guns are secured to the ends of rods 52 which are fixed by straps 53 to the framework of the open structure 6. The straps may be loosened when required so that the guns may be adjusted and aimed as desired. Each station includes spray guns above as well as below the table, so that certain exposed portions of the article above as well as below the table may be coated with paint. Inasmuch as the paint stations are similarly constructed, the one at the right is only partially disclosed. The description of one paint station applies to the other.

Each spray gun is connected by a hose 54 to a paint container 55 suspended from the upper bars of the framework 6 for gravity feed of paint from the container to the spray gun. Each gun is also connected by another hose 56 and an intermediate control valve 57 to a tank of compressed air 58. When the valve is opened, paint fed to a gun from the paint container is sprayed from the gun under air pressure supplied by the tank 58. Those guns suspended above the table will spray the upper portion of the exposed article, while those guns below the table will spray the lower portions of the article. It can be appreciated that a plurality of guns attached to a plurality of paint containers may be provided above as well as below the table and controlled by one or more valve elements, and each gun may be aimed to spray a particular uncovered portion of an article supported on the base plate of a member 27.

A booster or compression chamber 59 is connected in the hose line 56 between the valve and the air supply tank. The compression chamber serves to provide a steady and uniform flow of air to the guns.

Another feature of the invention lies in the manner by which the spray guns are automatically triggered for operation. The guns of a paint station are arranged to be automatically operated when the turntable has carried a member 27 bearing an article for painting to a point in line with the preset guns. As previously mentioned, the guns of a station are caused to fire upon the opening of the controlling valve 57. To this end, the valve which is of a conventional type, is opened and closed by a valve arm 60. The valve arm is constantly tensioned outward so as to hold the valve normally closed. The valve is suspended at a proper place in the framework 6 and is caused to be operated by camming means associated with the turntable. The camming means 61 is removably secured to the outer face of the handle element 41.

Upon rotation of the turntable, the cam element 61 is carried about and upon reaching a certain point it makes contact with a roller 62 of the valve arm, whereupon the valve arm is forced inward and the valve is opened. On opening of the valve, air under pressure from the supply tank forces paint from the connected guns in a spray upon the exposed portions of any article that may be carried at the time on the base plate of a member 27 of the associated cutout section 25. The spray continues as long as the cam element rides against the roller of the valve arm, and upon the cam being carried free of

the roller by the rotating table, the valve arm springs back in conventional manner to normal position to close the valve. To prolong or shorten the time during which the guns fire, cams of various dimensions may be affixed to the outer face of the handle element. To enable this the handle is provided with a plurality of threaded holes 63 in its outer peripheral surface, whereby cams of various lengths and at different points along the handle may be secured. It is understood that a plurality of valves may be positioned for successive operation by the cam of a handle and that each valve may control one or more spray guns.

As stated before, there are two paint spraying stations, one opposite the other. Between each station is a drying station 5, the purpose of which is to substantially dry the painted portions of an article before the article is carried to the next paint station, or before it reaches the replacement point after leaving the last paint station. A paint drying station comprises a suitable hot air blower 64 attached by suitable means 65 to the framework structure 6, one above the table and one below the table, and each directed to blow a continuous stream of hot air toward the painted article as it passes by on the rotating table.

The purpose of a member 27 is to support an article upon the table and also to bring about by the stencil design of its leaves a desired coloring pattern on the article. To produce the desired coloring pattern the different leaves of a member 27 are folded over upon the article prior to the article being carried by the table through a paint station.

In preparing the machine for operation, a member 27 is set in a cutout section 25 of the table. It is set therein so that the base plate rests at its sides on the shoulders 26, and so that the leaves 30 and 31 extend above and below the inner portions of the table in an angular position limited by the back edges of the cutout section, and so that the leaves 32 and 33 extend above and below the handle portion of the cutout section in an angular position limited by a set screw 66 in opposite faces of the handle element 41. It is intended in the operation of the machine that first one set of leaves will be turned over upon an article prior to its being carried through a paint station, and that subsequent to the restoration of the leaves, the second set of leaves will be turned over upon the article prior to it passing through the second paint station. Prior to passing from one paint station to the other, the article is passed through a drying station to prevent smearing as the second set of leaves are turned down upon the article.

Suitable means are provided for automatically turning the leaves of a member 27 over upon the article prior to the latter being carried through a paint station and also for holding the leaves turned down until the article has passed through the paint station. This means includes a set of fingers associated with each paint station. Those fingers designed for turning the outer leaves of a member 27 are located at the left of the machine and extend from the six o'clock position of the table to the nine o'clock position, while those controlling the inner leaves 30 and 31 are positioned on the right extending from the 12 o'clock position of the table to the three o'clock position. The fingers at the left comprise a pair of elongated rods 68, positioned one above and one below the table and each supported by a suitable bracket 69 extending from the framework. The finger 68 above the table has a pickup end 70 which is located approximately at the six o'clock position of the table and beyond the table. The finger gradually turns inward above the table and then straightens out as at 71 immediately above the marginal inner end of a cutout 25 at the nine o'clock position. The finger 68 below the table is similarly formed and positioned. The arrangement is such, that as the table rotates and carries a member 27 to the six o'clock position, the extended upper and lower outer leaves 32 and 33 ride upon the pickup ends 70 of the fingers. As the table continues to rotate the leaves ride the bend of the fingers and are gradually forced by the fingers over and down beneath the straightened ends 71 thereof and upon the base plate, in such manner that an article resting in the base plate will be confined between the stencil portions 36 of the outer leaves and the base plate. The leaves will be held in this position by the straightened ends 71 during the time the table carries the member 27 through the paint station at the nine o'clock position.

As the table continues to rotate, the member 27 with its article is carried free from beneath the straightened ends 71 of the fingers, whereupon the leaves 32 and 33 under tension of their springs 34 will pivot back to their normal extended positions. The uncovered article is then carried by the rotating table through a drying station 5 just before the 12 o'clock position.

The fingers at the right portion of the table which control the folding over of the inner stencil leaves 30 and 31 are similar to those just described, but are reversely formed. The pickup ends 72 of this set of fingers begin at the 12 o'clock position and are located above and below the inner portions of the table. By this arrangement the inner leaves 30 and 31 upon reaching the fingers will ride upon the pickup ends 72. The fingers gradually curve out toward the edge of the table and then straighten out as at 73 along the 3 o'clock position a little above and below the marginal open end of a cutout section 25 in that position. By this construction the leaves caused to be folded over upon the article and are held in the folded position by the straightened ends of the fingers until article has been carried by the rotating table through the second paint station at the right of the machine. After the leaves of the stencil member have cleared the fingers and pivoted free of the article, the latter is next carried through the second drying station 5 located just prior to the six o'clock position or point or place of beginning.

From the foregoing, it can be further appreciated that by providing members 27 having stencil leaves of multiple cutout designs and by uniquely positioning a plurality of guns and controlling valves, articles may be painted in a variety of colors with a single revolution of the table.

Having described my invention, it is my intent, however, to claim the invention not only as shown and described, but also in all such forms and modifications thereof as may be reasonably construed to be within the spirit of the Letters Patent and the scope of the appended claims.

I claim:

1. In a paint spraying machine of the character described including a rotatable turntable having a rectangular cutout section adapted to support a stencil, the stencil having a rectangular base plate removably supported in the cutout section, latch means removably holding the stencil base plate in the latter, a pair of rectangular stencil leaves hinged to an end of the base plate, one leaf for pivotal movement above the table and the other for pivotal movement below the table, spring means constantly urging the leaves in a direction pivoted outward from the base plate, means above and below the table limiting the latter directional disposition of the leaves to an anguluar position relative to the base plate, elongated curved finger means suspended above and below the table, drive means for rotating the table, the angularly disposed leaves being adapted to ride the finger means upon being carried about by the rotating table, the finger means being so constructed and arranged as to force the leaves over and upon the base plate with the continued rotation of the table, and the spring means serving to tension the leaves back to their angularly disposed positions upon the table carrying the latter free of the finger means.

2. In a machine as set forth in claim 1, wherein the

stencil includes a second and similar pair of leaves hinged for similar movement to the opposite end of the base plate of the stencil and the machine includes further finger means for similar action with respect to the second pair of leaves.

3. In a paint spraying machine as set forth in claim 1, wherein the machine includes paint spraying gun means suspended above and below the table at critical points with respect to the table, valve means controlling the firing of the gun means and including a trigger arm, and cam means carried by the latch means adapted to trigger the arm upon the table rotating to a particular position.

4. In a machine as in claim 1, wherein the latch means for removably holding the stencil in the cutout section includes a pair of lugs secured to the table and arranged to overhang rear marginal portions of the base plate and a handle element secured to the peripheral face of the table across the cutout section, the handle having a pair of arms including tongues at the ends thereof arranged to overhang the front marginal portions of the base plate, the handle being slideable upon a pair of bolts away from the table sufficiently to free the tongues from the base plate, spring means about the said bolts normally tensioning the handle to the peripheral face of the table, cam means carried on the outer surface of the handle adapted for triggering paint spraying guns positioned at certain anguluar positions of the table.

5. In combination in a paint spraying machine of the character described, a turntable having a stencil supporting place, the latter having a rectangular cutout extending to the outside of the table and a shoulder on each side of the cutout for supporting the base plate of a stencil, a pair of lugs secured one upon the rear portion of each shoulder and having a forwardly extending portion adapted to overhang the rear marginal edge of the base plate and a U formed handle element having

a pair of arms, a tongue at the extremity of each arm adapted to overhang the forward portions of the base plate, a shoulder formed at the base of each tongue adapted to limit against the outside edge of the base plate, and means slideably securing the handle element to the peripheral face of the table.

6. In the combination as in claim 5, wherein the stencil includes extended leaves hinged to one end of the base plate, and the handle element includes on opposite sides means for supporting the extended leaves at an angle to the table.

7. In the combination as set forth in claim 5, wherein the machine includes spray guns for spraying with paint an article carried on the stencil, the spray guns being connected to a control valve operable by an extended trigger arm thereon, cam means affixed to the outside of the handle element and adapted to trigger the valve arm to operate the control valve upon the handle being carried to a particular position by the turntable.

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