T. R. WILLWERSCHEID.

PAINTING MACHINE.

APPLICATION FILED SEPT. 25, 1919.

1,375,126.

Patented Apr. 19, 1921.

3 SHEETS—SHEET 1.

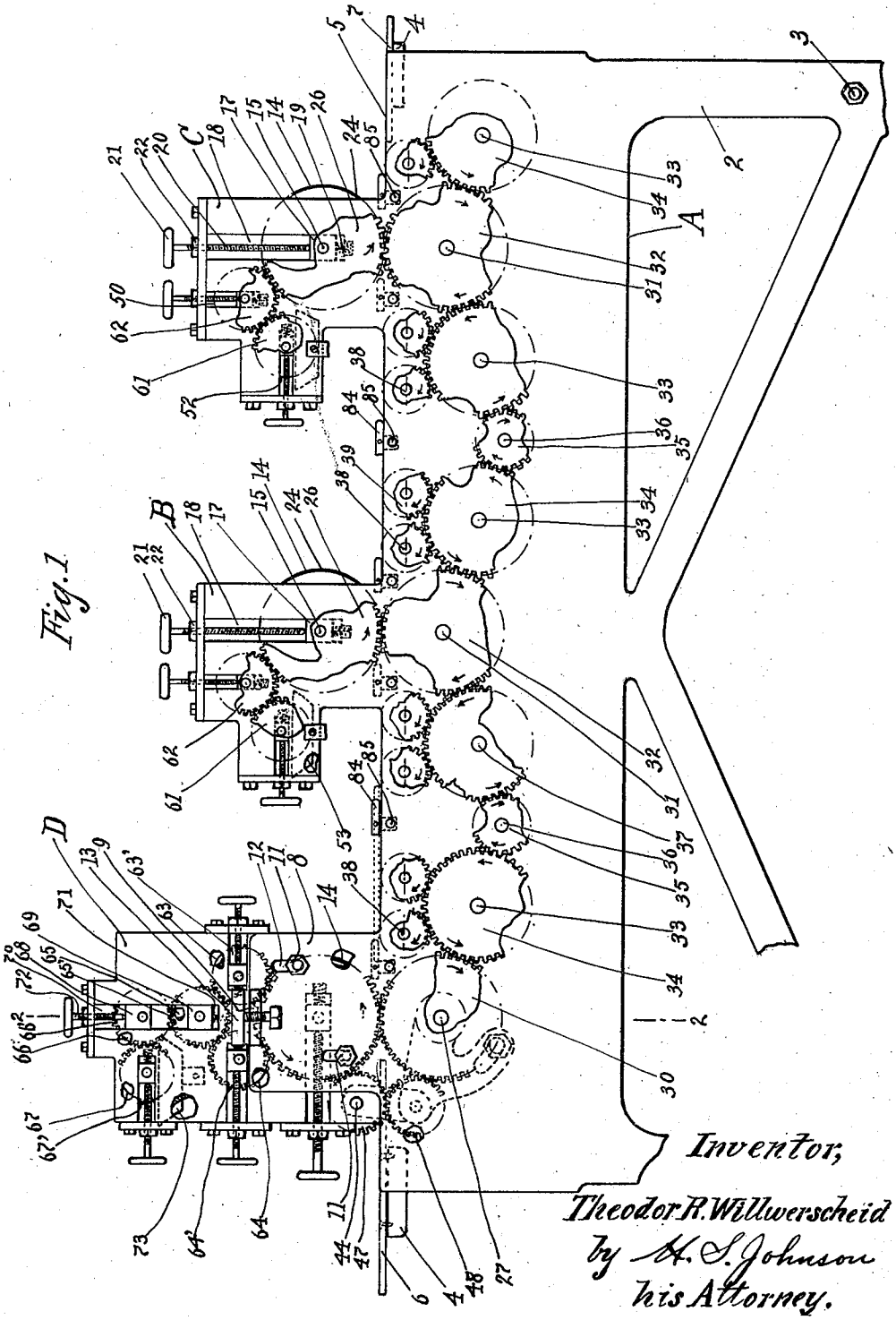


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2

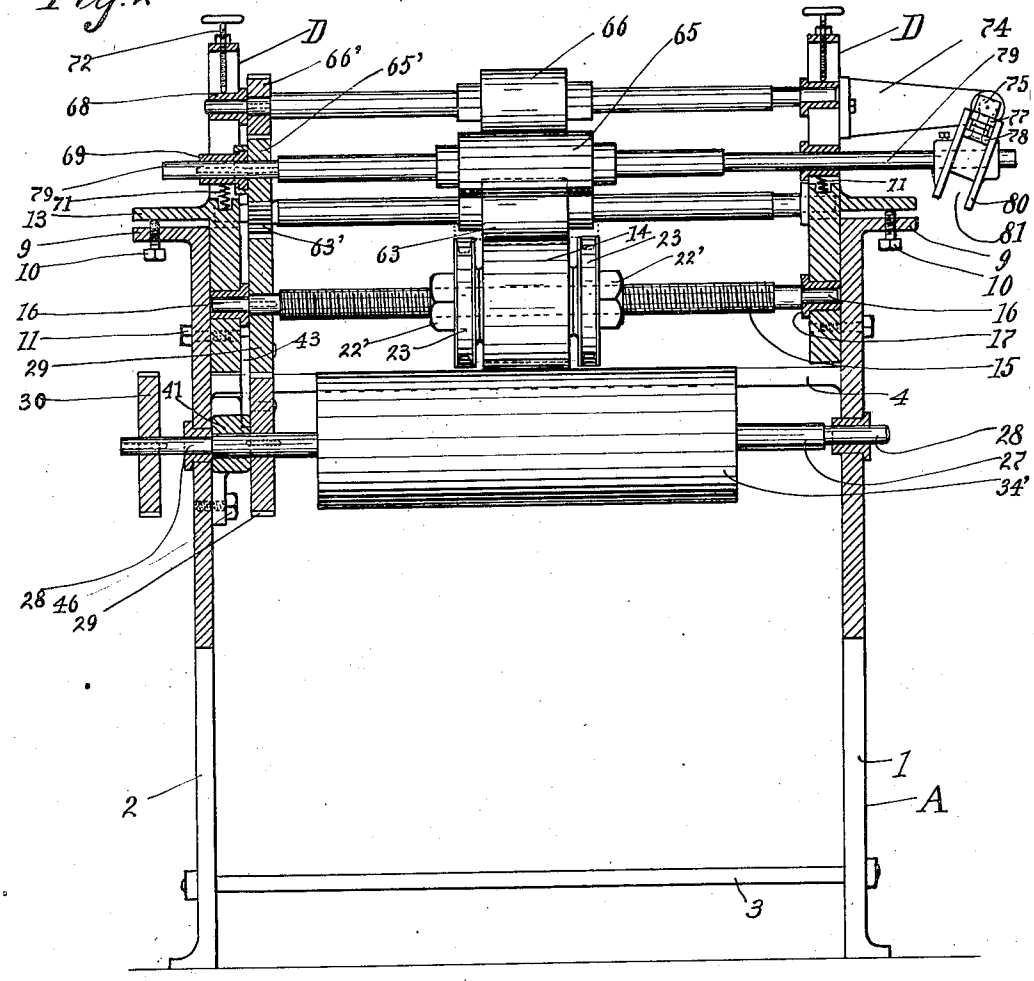


Fig. 9

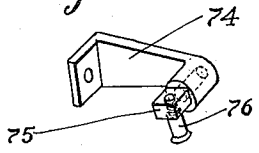
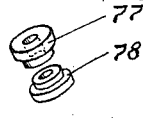


Fig. 10



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3 SHEETS—SHEET 3.

Fig. 4

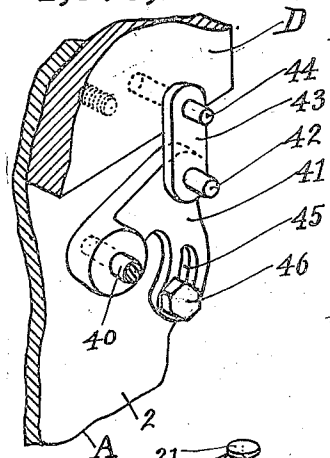


Fig. 3

Fig. 6

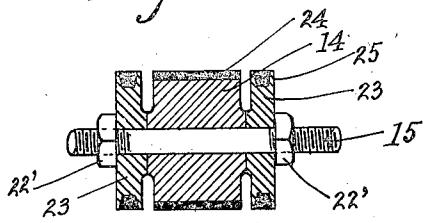


Fig. 5

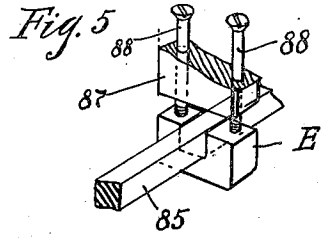


Fig. 7

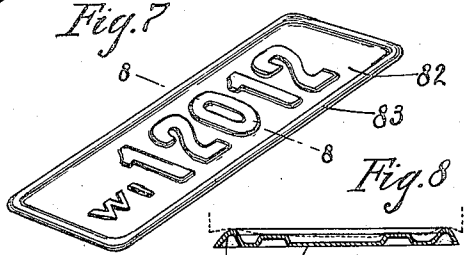
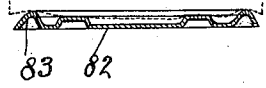


Fig. 8



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UNITED STATES PATENT OFFICE.

THEODOR R. WILLWERSCHEID, OF ST. PAUL, MINNESOTA.

PAINTING-MACHINE.

1,375,126. Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed September 25, 1919. Serial No. 326,362.

To all whom it may concern:

Be it known that I, THEODOR R. WILLWERSCHEID, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Painting-Machines, of which the following is a specification.

This invention relates to painting machines for painting the raised portions of embossed articles such as automobile tags and the like.

The invention has for its object to provide mechanical labor saving means for painting embossed signs wherein the sign may receive the first and subsequent coatings of paint each coat of a different mixture all in one operation.

A further object of the invention is to provide a device of the class described which may be adjusted so as to apply the paint on certain parts of the raised portions of the sign as desired.

The invention consists in the construction, combination and arrangement of parts hereinafter described and claimed.

In the drawings:

Figure 1 is a fragmentary side view of a paint machine embodying the invention, parts thereof being broken away.

Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary perspective view of the invention showing one of the paint applying elements.

Fig. 4 is a fragmentary perspective view showing the gear shifting link mounted on the inner side of the frame.

Fig. 5 is a perspective view of one of the guide blocks shown partly broken away.

Fig. 6 is a vertical view of a part of one of the paint applying rollers.

Fig. 7 is a perspective view of an embossed auto tag.

Fig. 8 is a sectional view on line 8—8 of Fig. 7, and

Fig. 9 is a perspective view of the oscillating roller support and its bracket, the roller not being shown, and Fig. 10 is a perspective view of the roller members alone.

In the drawings, A represents the main frame of the machine consisting of side members 1 and 2 suitably joined together by means of tie rods 3 at the base of the frame, and comparatively wide horizontally disposed flat tie members 4 at the top of said side members.

The side members 1 and 2 are formed with a horizontally disposed straight upper edge 5 flush with the feed table 6 and delivery table 7 at opposite ends of said side member, said table being mounted on the respective tie members 4 at what may be termed as the receiving end of the machine.

The side members are formed with upwardly extending rectangular comparatively wide supporting lugs 8 arranged laterally in alinement one on each side member.

Spaced at regular successive intervals from the lug 8 and extending likewise from the edge 5 on each of the side members are a pair of similarly constructed paint roller housings B and C, the housings on one side of the frame being in exact lateral alinement with the corresponding housings on the opposite side thereof.

The housings B and C and the lugs 8 are preferably integral with their respective side members, each of the latter being provided with an outwardly extending lug 9 at the upper edge thereof, said lug being threaded to receive a vertically disposed set screw 10.

Fitting flatly against the inner surface of each of said supporting lugs 8 so as to slide thereon and extending upwardly and beyond the latter and having screw threaded connection with the set screws 11 in the vertical disposed slots 12 in the supporting lugs 8 are the vertically movable housings D.

Each of said housings is formed with an outwardly extending lug 13 located directly over the lug 9 so as to rest upon the end of the set screws 10 in the latter, whereby the housing may be moved in a vertical plane and held positioned on the frame A by the set screws 11.

Rotatably mounted in each pair of the housings B, C and D is a paint applying roller 14. The rollers 14 are comparatively large in diameter, each roller being mounted on a shaft 15 reduced at its respective ends to form journals 16 adapted to run in journal boxes 17, which in turn are adapted to slide in runways 18, each journal box abutting against a coil spring 19 in the bottom of its respective runway. Thus, each roller together with its shaft and journal boxes is rendered bodily movable in the

housing for the purpose of adjusting the roller to various positions relative to its housing.

Adjustment spindles 20 one for each end of the roller is provided, the spindle having threaded connection in the housing at the opposite end of its respective runway and being provided with a suitable hand wheel and a lock nut 22. The spindle abuts against the journal box opposite the spring 19 so that when the screw is turned the box may be slid in the runway as desired.

The enlarged portion of the shaft 15 is screw threaded throughout the major portion of its length, the thread being a square thread which snugly fits the bore of the roller 14, a pair of lock nuts 22′ one on each side of the latter serving to hold the roller positioned thereon.

In the drawings are shown auxiliary paint applying rollers 23 one on either side of the roller 14 whereby border lines and the like on the auto tag may be separately coated. Any number of auxiliary rollers may be used as desired, the paint carrying rollers 63 and 64 being made long enough to cover additional roller as indicated in dotted lines in Fig. 2.

The paint applying rollers are surfaced peripherally with an elastic composition jacket 24 composed of elastic material such as is commonly used on inking rollers of printing presses. As indicated in Fig. 6 the elastic jacket surrounding the roller 14 extends across its full width while the auxiliary rollers are provided with side flanges 25 to support the elastic material on the periphery thereof.

As shown in Fig. 1 of the drawings the runways 18 in the housings B and C are disposed vertically while that in the housing D is disposed horizontally, the object of which will be hereinafter explained.

The shafts 15 in the housings B and C respectively extend at one of their ends through and beyond their respective journal boxes and carry rigidly on said extending end a spur gear 26, the pitch circle thereof being approximately equal to the diameter of the composition jacket of the paint applying rollers.

The shaft 15 in the housing D and the shaft 27 have journals 28 in the side members of the frame A and are parallel with the first named shaft the latter carrying rigidly the gears 29, said gears being located adjacent the inner faces of one of the housings D one above the other. The diameter of the gears 29 corresponds to that of the gears 26 as does also the gear 30 rigidly mounted on the extending end of the shaft 27.

Corresponding to the shaft 27 and located in the same horizontal plane therewith and beneath each of the shafts 15 in the housings B and C respectively are the shafts 31 also journaled in the side members in the frame and carrying rigidly on one of their outer ends the spur gears 32, the latter being exactly similar to the spur gear 30 and 26, each of the spur gears 32 meshing with its respective gear 26 in the housings B and C.

Rotatably mounted on studs 33 and projecting outwardly from the outer side of the side member of the frame A are the spur gears 34 arranged to mesh with the idlers 35 rotatably supported on the studs 36 also projecting outwardly from the side member 2 of the frame.

As shown in Fig. 1 of the drawings the gears 34 mesh with the gear 30 and the gears 32 so as to form a horizontally disposed gear train on the outside of the frame A.

It will be noted that the pitch circles of the gears 27 and 32 and the gears 29 meet in the horizontal plane corresponding to the plane in which lies the faces of the tables 6 and 7.

Rigidly mounted on the shaft 27 and shafts 31 and of a diameter equal to the diameter of the rollers 14 are the comparatively long rollers 34′, said rollers being made of extended length to permit the use of paint applying rollers of various lengths. The rollers 34 are centrally disposed between the side members of the frame and normally roll on the surface of the paint applying rollers 14, so that when an auto tag is inserted between them and the rollers are turned the composition jacket of the rollers 14 will grip the embossed surface of the tag, the soft surface of the composition yielding to the irregular height of the embossed portions of the tag (as indicated in dotted lines in Fig. 8) so that the paint may be applied to all the embossed surfaces irrespective of their height. The mechanism supported on each of the housings B, C and D together with the roller 34 constitutes a complete paint applying device or unit, the three units being operatively connected by the gear train. The paint applying mechanism supported on the housing D may be termed the initial paint applying device.

Parallel with the shafts 15 and 31 and also rotatably mounted at their ends in the numbers 1 and 2 of the frame and being of uniform diameter and of a length equal to that of the rollers 34 and the carrier rollers 37 mounted on shafts 38, the latter projecting through and beyond the side member 2 and carrying on said extended end the spur gears 39.

As shown in Fig. 1 there are nine carrying rollers eight thereof being arranged in pairs, one pair meshing with each of the four gears 34 and the ninth thereof meshing with the gear 34 adjacent the receiving table 7.

The rollers 37 are arranged along the edge 5 of the frame so that their peripheries are tangent therewith, the rollers being so spaced along said edge as to carry in continuous travel an auto tag of ordinary length.

As explained in the foregoing, the housings D may be raised or lowered by means of set screws 10 so as to carry the mechanism supported thereon bodily with it. Obviously, the gears 29 would be moved out of mesh if the housings were raised any considerable distance. To obviate disconnection of the gears applicant has provided mechanism (shown in Figs. 1 and 4) rotatably mounted on the frame by means of the stud 40 and adapted to swing in a vertical plane, a link 41 having pivotal connection 42 with the link 43 which in turn has pivotal connection 44 with the housing D, the latter being mounted on the side member 2 of the frame A. The link 41 is provided with an arcuate slot 45 arranged concentric with the pivot 40 and adapted to receive a set screw 46 screw threaded in the side member 2 of the frame so that the link 41 may be swung around its pivot to any desired degree and then set against movement by means of the set screw. On the pivot pins 42 and 44 are rotatably mounted so as to mesh with each other the gears 48 and 47 respectively, the gear 47 meshing in turn with the upper gear 29 on the shaft 15. Thus, the housing D may be raised to any desired distance without operatively disconnecting the mechanism carried thereby from the gear train on the outer side of the side member 2 of the frame. The gear 48 may be termed a floating idler in that it is shiftable bodily around the gear 34′ on the shaft 27.

By means of the belt pulley 49 (Fig. 3) rigidly mounted on one of the shafts 38 the gear train may be driven from any suitable power source to actuate the paint applying rollers 14. In Fig. 3 is shown a perspective view of the housing B which is an exact duplicate of the housing C.

Rotatably mounted in the upper portion of the housing is the roller 50, the shaft 51 thereof being journaled in the journal block and adjusted by an adjusting screw similar to the rollers 14 hereinbefore described.

Contacting with the roller 50 and similarly mounted in the housing is the roller 52, the periphery of the latter depending into a paint receptacle 53 supported on a transverse bar 54 secured to the housing. The receptacle or pan 53 is removably supported on the bar 54 by means of an angle member 55 having slots 56 arranged longitudinally with the bar to receive set screws 57 whereby the angular member may be slidably held, a spring member 58 urging said angular member constantly in a lateral direction to press the pan against an oppositely disposed angular member 59 secured on the bar 54. Each angular member is provided with a yoke 60 adapted to embrace the end of the pan to effectively grip the latter. Thus, when it is desired to raise the roller 14 to accommodate auto tags of various thicknesses the adjustment screws 20 may be suitably adjusted to keep the rollers 50 and 52 and 14 in contacting relation.

The shafts 51 and 52 extend through and beyond the housing B and carry at their outer ends the gears 61 and 62 meshing with each other, the gear 62 in turn meshing with the gear 26 on the shaft 15. Thus, when the gear train is actuated the paint carrying rollers 50 and 52 are positively driven.

Between the housings D above the roller 14 are rotatably mounted the paint carrier rollers 63, 64, 65, 66 and 67, the rollers 63, 64 and 67 being mounted in the housings after the manner hereinbefore described in connection with the rollers 14, it being thought not necessary to further describe the mode of mounting; the rollers 65 and 66, however, being arranged in a vertical transverse plane have their journal boxes 68 and 69 slidably mounted in a single runway 70, the roller 65 resting on a spring 71. An adjustment screw 72 similar in all respects to the adjustment screw 20 hereinbefore described engages the journal box 68 of the roller 66 whereby both rollers 65 and 66 being constantly in contact with each other peripherally may be bodily moved in the runway 70. The rollers 63 and 64 are adapted to roll peripherally on the roller 14, but they may be adjusted if desired to be slightly separated therefrom as can also the roller 67 with respect to roller 66 and in turn have peripheral contact with the roller 65. The rollers 50 and 52 can also be adjusted so as to leave a small space between them and between the rollers 50 and 14 so that the paint will be transferred by capillary attraction. A paint receptacle or pan 73 constructed on similar lines to pan 53 hereinbefore described, receives the lower portion of the roller 67 whereby the paint in the pan is carried to the roller 66 from whence in turn it is transferred to the roller 65 then to the rollers 63 and 64 and finally to the paint applying roller 14 which in turn contacts with the article to be painted. Each of the rollers 63, 64, 65, 66 and 67 carry on their respective shafts at a point adjacent the housing D on side member 2 a gear wheel indicated by the numerals 63, 64, 65, 66 and 67 in order to identify them with their respective rollers. As shown the gears 65′, 66′ and 67 mesh with each other while gear 65′ meshes with both gears 63′ and 64′ both of the latter meshing with the gear 29.

Referring to Fig. 2 of the drawings, the roller 65 it will be noted is shown somewhat longer than rollers 67 and 66 64 and 63 so as

to permit the latter to reciprocate laterally for the purpose of distributing the paint as it is carried over from the pan 73. The roller is reciprocated by mechanism which may be described as follows: On that movable housing D mounted on the side member 1 of the frame and extending outwardly therefrom is the bracket 74, the latter rotatably supporting a pivot member 75 adapted to rotate in a transverse vertical plane with respect to the machine and having a stud 76 perpendicular to its axis of rotation, said stud forming a journal for the rollers 77 and 78. One the shaft 79 of the roller 65 is a grooved circular cam 80, the groove 81 thereof being rectangular in cross section and adapted to receive the rollers 77 and 78, the latter fitting snugly into said groove and being adapted to roll on the side walls thereof. The circular cam is mounted on the shaft 79 so that the axis of rotation of the shaft 79 is at an angle with a perpendicular erected coincident with the center of said circular cam. Thus, when the shaft 79 is rotated the rollers 77 and 78 roll in the groove 81 and rotate partly around the axis of rotation of the pivot member 75 causing the shaft 79 to reciprocate. Inspection of the gear train will disclose that when the pulley 49 is driven to the right the rollers 34 and the rolls 39 will travel in feeding direction while the rollers 14 will travel in opposite direction, the gears and rollers being so proportioned as to secure the same peripheral velocity in all the rollers and rolls.

In Fig. 7 is shown an ordinary auto tag 82 formed with an embossed bead 83 completely surrounding the outer edge thereof. The numerals are not embossed as deeply as the bead as is plainly indicated in Fig. 8 it therefore requiring a comparatively soft composition coating on the rollers 14 to effectively distribute the paint on the embossed surfaces.

In the machine illustrated in the drawings the tag is fed lengthwise into the machine from the table 6 between the rollers 14 and the rollers 34; it is then carried forward frictionally, it being guarded by the spaced spring blades or fingers 84 secured at the top of the movable clocks E adapted to be clamped on the transverse rods 85 extending from one side member to the other of the frame. The rods are shown square in cross section and fit loosely into a notch in the lower portion 86 of the block 8, the upper portion 87 thereof being adapted to be clamped over said rod by means of the screws 88 piercing the block 87 and having screw threaded connection with the block 86. The spring blades 84 are arranged in the path of the traveling tag and engage under stress the passing tag as it is carried forward by the rollers 37 from one paint applying roller to the other. In operation the pans 73, 53 and the pan suspended in the housing C, are each supplied with a quantity of paint, which latter may be ordinary sign paint of any suitable color or colors, it being understood that the circumferential surface of the paint applying roll of each unit may be cut away in places, if desired, so that a second or third coat, as the case may be, will be applied to certain parts only, of the tag. It is also to be understood that the paint may be mixed in the ordinary way to render it suitable for first, second and third coat purpose, it being common knowledge in the painter's art to add or mix certain ingredients for subsequent coats, such, for example, as linseed oil or japan drier. By judiciously using the adjustment screws 20 for the various rollers the pressure brought to bear on the auto tag may be varied as required, the springs under each of the journal boxes urging the rollers constantly in an upwardly direction away from the pass tag.

I claim:

1. A machine of the class described, comprising a comparatively long narrow frame having at its respective ends near the top thereof a feed and a discharge table, said tables being disposed in the same horizontal plane, three separate rotary paint applying units located at intervals between said tables partly above the latter, each unit consisting in part of two comparatively large transversely disposed rotatably mounted rollers supported one above the other on the frame, the upper roller having a resilient periphery, the periphery of each roller being tangent to said horizontal plane, an open top paint receptacle above said rollers, rotatable transversely disposed roller means extending from the interior of said receptacle to the upper of said rollers for carrying paint when actuated from said receptacle to the latter, transversely disposed conveyer rolls rotatable on the frame arranged beneath said horizontal plane but peripherally tangent thereto and located between said units, a gear train operatively connected with all of said units and said conveyer rolls to actuate them, and driving means for said gear train.

2. A machine of the class described, comprising a comparatively long narrow frame, a plurality of rotary paint applying devices arranged at intervals at the top of the frame throughout the length thereof, the rotary parts of each device being rotatable in a vertical longitudinally disposed plane relative to the frame, each rotary paint applying device consisting in part of a comparatively large vertically adjustable rotatable paint applying roller having a soft rubber-like periphery and a hard roller of approxi-

mately like size rotatably mounted directly beneath said paint applying roller and capable of coöperating with the periphery of the latter to grip a tag between them, said lower roller of each rotary device being mounted in the same horizontal plane, a rotary conveyer means extending between said rotary devices, the carrying surface thereof being on a level with the top of said lower rollers, a gear train operatively connected with all of said rotary paint applying devices and said rotary conveyer means for actuating said devices and said conveyer means, and means for driving the gear train.

3. A machine of the class described, comprising a comparatively long narrow frame, a plurality of rollers having a composition facing rotatable in a vertical longitudinally disposed plane at the top of said frame, the rollers being arranged in a row one behind the other, adjustment means for bodily moving said rollers, a plurality of coöperating rollers equal in diameter to said faced rollers mounted in a horizontal plane one directly beneath each of the latter and in contacting relation therewith, conveyer rolls rotatable between said coöperating rollers and parallel therewith, the top of the conveyer rolls being on a level with the top of said coöperating rollers, a gear train operatively connected with all of said rolls and rollers, said gear train being so proportioned as to drive when actuated all of said rolls and rollers at the same peripheral velocity.

4. A machine of the class described, comprising a frame, a plurality of rotary paint applying devices arranged one behind the other, each device consisting in part of a set of rollers consisting of a soft faced vertically adjustable roller and a stationary roller adapted to coöperate with said soft faced roller to grip and roll an auto tag between them, means extending between said rotary paint applying devices for carrying the auto tag from one set of rolls to the other, actuating means for the rotary paint applying devices and said carrying means, and laterally adjustable tag guiding spring fingers arranged at intervals along the path of the traveling tag and adapted to resiliently engage opposite edges thereof.

5. A machine of the class described, comprising a comparatively long frame, a plurality of transversely disposed pairs of rotatably mounted rollers said pairs being arranged in successive positions on the frame, each pair consisting of a roller having a rubber-like jacket on its periphery and an unjacketed roller, the two rollers being mounted one above the other and adapted to roll over opposite sides of an automobile tag inserted between them, means for simultaneously rotating said pairs of rollers, and adjusting means for one of each pair of rollers whereby the distance between the rollers of each pair may be changed to vary the pressure exerted on the inserted tag.

6. A machine of the class described, comprising a frame, an initial rotary paint applying device at one end of the frame, a plurality of spaced secondary rotary paint applying devices spaced from said initial paint applying device, each device including a pair of transversely disposed rotatable rollers adapted to squeeze an automobile tag between them and engage with their circumferential surface when actuated opposite faces of the tag to apply paint on one of them and to advance said tag toward the next succeeding paint applying device, means for actuating said paint applying devices and means actuated by said actuating means for conveying the tag from one paint applying device to the next succeeding paint applying device.

7. A machine of the class described, comprising a frame, an initial rotary paint applying device at one end of the frame, a plurality of spaced secondary rotary paint applying devices spaced from said initial paint applying device, conveyer means for conveying the tag from one paint applying device to the next succeeding paint applying device, said initial paint applying device consisting of a transversely disposed roller rotatably mounted on the frame, housing means adjustably supported on the frame above said roller, a roller having a resilient covering arranged parallel with said first named roller mounted on said housing means directly above the latter, and adapted to cooperate therewith to roll a tag between them, a paint holding reservoir supported at the top of said housing means, a paint conveying roller above said reservoir extending into the interior of the latter, and a plurality of rollers each having a shaft journaled in said housing means, said rollers being in peripheral contacting relation extending from said paint conveying roller to said covered roller, means for actuating all of the rollers, and cam mechanism extending from said housing means to the shaft of one of said contacting rollers whereby when the rollers are actuated it is caused to reciprocate laterally as and for the purpose set forth.

8. In a machine of the class described, the combination with the frame and a horizontally disposed roller rotatably mounted thereon said roller carrying a gear wheel, of housing means located above said roller, adjustment means for said housing means whereby the housing means may be shifted on the frame and so held thereon, paint dispensing devices including a gear train for actuating the latter mounted on the housing means and extending to said roller, an idler gear rotatable bodily around said gear wheel

and in constant operative engagement with the latter and said gear train, means for actuating said roller, and means for selectively holding said idler positioned relative to said gear wheel.

9. In a machine of the class described, comprising a frame, a plurality of rotary paint applying devices coöperatively arranged at regular intervals along the top of said frame, tag conveyer means between said devices, a gear train operatively connected with all of said paint applying devices and said conveyer means and actuating means for said gear train.

10. In a machine of the class described, comprising a frame, a plurality of spaced rotary paint applying devices operatively connected together in a row at the top of said frame, and actuating means for said devices, said operative connection consisting in part of a gear train extending to all of said paint applying devices, each of the latter consisting in part of a paint reservoir, and a plurality of intercontacting paint distributing rolls extending from said reservoir to said gear train and operatively connected with the latter to be positively driven thereby.

11. A machine of the class described, comprising a frame, a plurality of paint applying devices successively positioned on said frame and means for actuating said paint applying device each paint applying device consisting in part of a horizontally disposed shaft the major portion thereof of uniform diameter and formed with a square threaded screw thread, said shaft having reduced journal portions at its respective ends to permit a roller bored to fit slidingly over said threads to be slipped on said shaft from either end thereof.

12. A machine of the class described, comprising a frame consisting in part of oppositely disposed spaced side members, a plurality of coöperating paint applying devices successively positioned at the top of the frame and mounted thereon between said side members a part of each of said devices extending through one of said members, a gear train for actuating said devices a part thereof mounted on said extending parts and part thereof mounted on the side member through which said parts extend and means for actuating said gear train.

13. In a machine of the class described, rotary paint applying mechanism comprising, in part, a pair of horizontally disposed parallel rollers rotatably mounted one above the other so as to grip an automobile tag between them and engage opposite sides of the latter when actuated, one of said rollers having a resilient periphery, a paint holding receptacle, means including rotatable transversely disposed roller means extending from the interior of said receptacle to one of said rollers for carrying, when actuated the paint from said receptacle to the latter, means for supporting the tag in position to be inserted between said rollers and for conveying the tag away from the latter, a gear train operatively connected with said rollers, paint carrying means, and tag supporting and conveying means, and means for actuating the gear train.

In testimony whereof I affix my signature.

THEODOR R. WILLWERSCHEID.