

# Semi Automatic wall spray painting machine

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## ABSTRACT

Today, Automation is the necessary in almost every field that we come across. This project focuses on one such implementation of automation to paint walls. This project deals with the development and fabrication of automated robotic vehicle which can be used for painting walls. This vehicle consists of an automated robotic platform which is incorporated with a vertical lift. When initiated the robot starts painting along the vertical axis from the bottom of the wall using the vertical travel system provided. After completing the complete pass along vertical axis, the robot moves ahead, to cover the next pass of unpainted wall. This process continues till the complete wall is painted. Despite of widespread reach of technology and advancements in automation, Construction work has been neglected from automation point of view. Painting is one the major process for construction and is almost done by everyone from domestic to commercial projects. Today wall painting is usually done with the painting rollers which are dipped in the painting bucket and rolled over the wall which applies the required paint to the wall. Using this method painting can be done faster compared to conventional brush painting, but is ineffective compared to spray painting.

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## I. INTRODUCTION

It's is the coating applied to the walls a building , to provide a protective coating which would prevent rain penetration. it also act as a decorative finish to enhance the appearance of the building, This is the technique used to render paint automatically on the walls of building, it is the traditional craft that has evolve over many centuries .basic rendering began as a method of excluding droughts and rain by using paints these materials has once significance disadvantage in that they were not very resistant to water this method is very easy and efficient ,this method has different requirements as per the different places and applications by using this machine we can paint 500 square range.

Color changes everything. Or lack of color, if that's your thing. Point is, everyone knows you can give your drab, washed-out walls a burst of brilliant depth (or wash away your decorating sins with virgin white) just by picking up a paint can and having at them. That's the power of a coat of paint: It rearranges your reality. Which is why painting is the most oft-tackled home-improvement project. While you don't have to be a pro to learn how to paint like one, there is

more to a good paint job than just slathering some color on the wall. That's where we come in. On the following pages, This Old Housetechnical editor Mark Powers shows how to coat your walls expertly in one weekend, from the first scratch of the pole sander to the final feather of the brush. And you won't be wasting time taping off every corner or backtracking with the touch-up brush like an amateur. As long as you stay organized and methodical, you'll be able to get on with the satisfying business of transforming your room—and with it your whole outlook.

These painting tips will help you roll your walls quickly and smoothly—without leaving roller marks. We'll show you the tricks and techniques that painting pros use to get a perfectly painted room. All you need are some basic tools to paint fast, get great results and make clean up a breeze. Painting is one of the least expensive ways to make over a room, so grab a roller and let's get to work. Load the roller cover with paint Load the roller cover with paint by dipping into the paint about 1/2 in. and then rolling it against the screen. Filling a dry roller cover with paint will require five or six repetitions. After that, two or three dips are all you need. Leave the roller almost dripping with paint. Most of you have probably used paint rollers before, with varying

degrees of success. Maybe you just plunged right in and started rolling, developing your own technique as you went. Or maybe you read the instructions telling you to apply the paint in some pattern, usually a “W,” before rolling it out. We're going to show you a slightly different approach. In this article, we'll teach you a simple method to quickly spread a smooth, even coat of latex paint on the wall. It's not fancy, but it gets the job done in record time and eliminates common problems like light areas, roller marks and built-up ridges that sometimes plague first-time painters.

However, even the best technique won't work with poor-quality equipment. Don't waste your money on those all-in-one throwaway roller setups when you can buy a pro setup that will last a lifetime for under \$20. Start with a good roller frame. To extend your reach and give you better control, screw a 48-in. wood handle (\$3) onto the end of the roller. You could also use a threaded broom handle. You'll need a container for the paint. While most homeowners use paint trays, you'll rarely see a pro using one. That's because a 5-gallon bucket with a special bucket screen hung over the edge works a lot better. Here are a few of the advantages of a bucket and screen over a roller pan: It's easy to move the bucket without spilling. The bucket holds more paint. You won't have to frequently refill a pan. You're less likely to trip over or step in a bucket of paint. It's quicker and easier to load the roller cover with paint from a bucket. It's easy to cover a bucket with a damp cloth to prevent the paint from drying out while you're taking a lunch break. Use an old drywall compound bucket or buy a clean new bucket. Add bucket screen and you're ready to go. Roll paint on the wall. Lay the paint on the wall with a sweeping stroke. Start about a foot from the bottom and 6 in. from the corner and roll upward at a slight angle using light pressure. Stop a few inches from the ceiling. Now roll up and down back toward the corner to quickly spread the paint. You can leave paint buildup and roller marks at this step.

Don't worry about a perfect job yet. Roll up and down, from floor to ceiling and move over about three-quarters of a roller width each time so you're always slightly overlapping the previous stroke. When you reach the corner, roll as close as you can to the adjacent wall without touching it. Repeat Steps 1 through 3 until the entire wall is painted. Take a wool-blend roller cover for a spin. Use a quality roller sleeve. A good roller cover is the most important part of your rolling setup. The most important part of your paint rolling setup is the roller cover, also known as a sleeve. It's tempting to buy the cheapest cover available and throw it away when you're done. But you won't mind the few extra minutes of cleanup time once you experience the difference a good roller cover makes. Cheap roller covers don't hold enough paint to do a good job. It'll take you four times as long to paint a room. And you'll likely end up with an inconsistent layer of paint, lap marks and built-up ridges of paint. Instead, buy a 1/2-in. nap wool blend roller cover and give it a try. (One good one is the Sherwin-Williams Poly/Wool cover, about \$6, which is a combination of polyester for ease of use and wool for maximum paint capacity.) With proper care, this may be the last roller cover you'll ever buy. Wool covers do have a few drawbacks, though. They tend to shed fibers when they're first used. To minimize shedding, wrap the new roller cover with masking tape and peel it off to remove loose fibers. Repeat this a few

times. Wool covers also tend to become matted down if you apply too much pressure while painting. Rolling demands a light touch. No matter what roller cover you're using, always let the paint do the work. Keep the roller cover loaded with paint and use only enough pressure to release and spread the paint. Pushing on the roller to squeeze out the last drop of paint will only cause problems.

### **Tips for a Smooth the paint**

Smooth the paint along the ceiling using a long horizontal stroke without reloading the roller with paint. If you are skilled enough to roll within an inch of the ceiling while rolling vertically, you can skip this step. Keep a wet edge. Keeping a wet edge is crucial to all top-quality paint jobs, whether you're enameling a door, varnishing furniture or rolling paint on a wall. The idea is to plan the sequence of work and work fast enough so that you're always lapping newly applied paint onto paint that's still wet. If you stop for a break in the middle of a wall, for example, and then start painting after this section has dried, you'll likely see a lap mark where the two areas join. The rolling technique we show avoids this problem by allowing you to quickly cover a large area with paint and then return to smooth it out—which brings us to the second important painting technique. Lay it on, smooth it off. The biggest mistake most beginning painters make, whether they're brushing or rolling, is taking too long to apply the paint. Then quickly spread it out and repeat the laying-on process again. This will only work with a good-quality roller cover that holds a lot of paint. Until you're comfortable with the technique and get a feel for how quickly the paint is drying, cover only about 3 or 4 ft. of wall before smoothing the whole area off. If you find the paint is drying slowly, you can cover an entire wall before smoothing it off. Get as close as you can. Since rollers can't get tight to edges, the first painting step is to brush along the ceiling, inside corners and moldings. This “cutting in” process leaves brush marks that won't match the roller texture on the rest of the wall. For the best looking job, you'll want to cover as many brush marks as possible with the roller. Do this by carefully rolling up close to inside corners, moldings and the ceiling. Face the open end of the roller toward the edge and remember not to use a roller that's fully loaded with paint. With practice, you'll be able to get within an inch of the ceiling rolling vertically, and can avoid crawling up on a ladder to paint horizontally like we show above.

Pick out the lumps before they dry. It's inevitable that you'll end up with an occasional lump in your paint. Keep the roller cover away from the floor where it might pick up bits of debris that are later spread against the wall. Drying bits of paint from the edge of the bucket or bucket screen can also cause this problem. Cover the bucket with a damp cloth when you're not using it. If partially dried paint is sloughing off the screen, take it out and clean it. Keep a wet rag in your pocket and pick lumps off the wall as you go. Strain used paint through a mesh paint strainer to remove lumps. Five gallon size strainers are available at paint stores for about \$1.

Scrape excess paint from the roller before you wash it. Use your putty knife, or better yet, a special roller-scraping tool with a semicircular cutout in the blade. Then rinse the roller cover until the water runs clear. A roller and paint brush

spinning tool, available at hardware and paint stores for about \$8, simplifies the cleaning task. Just slip the roller cover onto the spinner and repeatedly wet and spin out the roller until it's clean.

## II. OBJECTIVES OF PROJECT

- Taking safety as prime consideration: This device is safer in all respects.
- To develop a device this can make work simple.
- To develop a device which can run cost efficient
- This device which will make the construction work simple.

## III. LITERATURE SURVEY

Warszawsky and Kahane has explained the contribution in the robotics towards the automation. International Journal of Robotics and Computer Integrated Manufacturing He has developed a robot for interior finishing tasks named "TAMIR", and was used in four interior finishing tasks namely; painting, plastering, tiling and masonry. The robot has 6 DOF (Degrees Of Freedom) with an average reach of 1.7m and end effector payload of 30 kg. It is mounted on 3 wheeled mobile-robot which gives another 3 DOF. The platform moves between workstations and at each one it deploys four stabilizing legs. The robot arm used is the S-700 model made by General Motors, of 500 Kg weight.

Naticchia Has contributed towards the revolution in the robotics by bringing his innovatives ideas into society. International Journal of Robotics .A scaled down robot setup for interior wall painting together with a multicolor spraying end tool were implemented by Naticchia and claimed to work in full scale without reduction in performance. The robot named "Pollock#1" had 6 DOF, a nominal reach of 0.4 m and a maximum payload of 4kg. It should be fixed on a 2 DOF hexapod for horizontal movement but was not actually used in experiments.

Aris Has contributed in the introduction for ceiling painting. International Journal of Ceiling painting by use of modern technology. A full scale mechanism for ceil painting was introduced by Aris . It had 3DOF without considering those of the platform, a working envelope of (84cm by 72 cm by 122 cm). Significant improvement in painting time and cost had been reached where 46 m<sup>2</sup> of ceil were painted in 3.5 hours which is 1.5 times faster than manual painting. Most of us can do an okay job of painting a room. But a seasoned professional does a great job. Obviously, pros have more experience than the average homeowner, but they also know techniques and tricks that make them better painters. We asked six pro painters to share those secrets. They probably kept a few tips to themselves, but they provided us with more than enough to help you work more efficiently and get better results. Some of what you'll read may surprise you. For instance, their secrets won't cut painting time. Painters spend two to four days on an average-size room. That's how long it takes to prep, prime and paint correctly. It's more work, but when you stand back to admire the results, you'll agree it's time well spent. Clear the Decks . To begin, move everything out of the room. Every painter we spoke with had a horror story about the time he didn't follow Rule No. 1. Bigger pieces of furniture can sometimes be left covered

in the center of larger rooms, but if you are repairing drywall, says Chris Span, of Span's Quality Painting in Mobile, Alabama, "Take everything out. Drywall dust goes everywhere." Remove doors, light fixtures and hardware, and label everything with masking tape. Also, invest in drop cloths. "It's surprising how well a few drops of paint can cover a floor," says Rich Maceyunas, of Maceyunas Painting and Wallpaper in Waterbury, Connecticut. Buy high-quality drop cloths, such as canvas or paper-backed plastic. (Paint soaks right through lightweight fabrics and bedsheets.) Plastic sheeting works, but it's very slippery and doesn't absorb drips.

Benjamin Moore These top tips from the experts at Behr and Benjamin Moore will make your next paint job a smashing success. Wait for dry weather. Humidity means drips and slow drying, so avoid painting on a rainy day. If you must paint when it's humid, take your time — and take advantage of slow-drying paint to correct your errors before moving on to the next coat. But don't overwork, or it will show when you're finished. Do a thorough visual inspection and prep. Any cracked, flaking, or peeling areas need to be lightly sanded or scraped (and then thoroughly rinsed) before applying new primer and paint, because the weight of the new coat will pull the old paint loose. "You'll just end up wasting your time and money if you don't tackle that first," says Tom Lee, Senior VP of Consumer Marketing for Behr. Greasy spots may also need a bit of washing with soap, followed by a rinse with clean water. Otherwise, give the walls a quick wipe-down with a damp cloth so that paint will have a clean, dust-free surface to stick to. Buy high-quality brushes, roller covers, and painter's tape. If you're splurging on great paint, you definitely don't want to pinch pennies on the application. Good brushes and roller covers give excellent coverage so that you don't waste time and paint on re-application, and high-end painter's tape is the real deal when it comes to sealing out drips and blurs. The more texture your walls have, the thicker the nap you'll want on your roller cover so that it can reach into crevices and give complete coverage. But if you go too thick, you might actually create texture where you don't want it, so be prepared to give your salesperson details about what you're painting. Protect anything you don't want painted. You will never regret the time you spend covering floors, furniture, and hardware before you begin a paint project. Drop cloths are a must, and small plastic sandwich bags secured with tape are an easy way to protect doorknobs. Remove light switch and outlet covers. If you're impatient, you'll be tempted to skip this five-minute step, but don't. Use primer. Paint-and-primer combinations are fine if you already have a clean, smooth surface, but if there are any issues with the wall or it's been more than eight years since you last painted, bite the bullet and go with a separate primer. If you need to cover an especially challenging surface (say, glass or high-gloss paint), use a bonding primer such as Benjamin Moore's Insl-x Stix Waterborne Bonding Primer Adhesion Interior & Exterior Bonding Primer. Box your paint. Get your salesperson to help you with a realistic estimate of how much paint you'll really need so that you can buy it all at once. Then, instead of using one gallon at a time, combine all the paint into one large container and mix it thoroughly. This is known as "boxing" your paint, and it keeps your color consistent from

beginning to end. Let the roller do the work. Today's premium paints flow on easily, and you've already chosen a good roller cover (right?), so there's no need to use much pressure. Be sure to use an extension pole so you can reach the maximum amount of area with the least effort — and without straining your back. Paint from top to bottom. After you've cut in your edges at the ceiling and baseboard using a brush, use your roller to apply paint from the ceiling downward. Amateurs often have telltale drips and spatters at the end of a paint job, but pros paint right over their mistakes as they work their way down the wall. Once an area starts to dry, it's best to leave it alone. Going back over it can leave marks and color streaks in the paint's surface. Painting your home can be completely hassle-free with the right planning.

#### IV. METHODOLOGY

The Process Of Painting are as follows

- a) Pre-painting work
- b) Surface preparation
- c) Painting

##### Pre-painting

Check surface for incidence of dampness or water seepage. Rectify the water seepage problem at source. This could mean repairing leaking pipes or cracks in the exterior walls. Any loose plaster should be removed from the wall. Check for loose plaster by tapping on the walls. A hollow sound indicates loose plaster. Masonry work is to be undertaken to fill up all cracks and repair broken plaster. Please ensure proper curing time (7 to 21 days depending on extent of plastering). When replastering is done it should be given proper drying and stabilising time to bridge the cracks or smoothen the surface. Surface Preparation Allow newly plastered surfaces to mature for a period of at least 6 months after the application of a coat of lime ash to ensure thorough drying of plaster. Popping of plaster, commonly associated with new Neeru plasters, can be taken care of subsequently during painting.

##### Painting

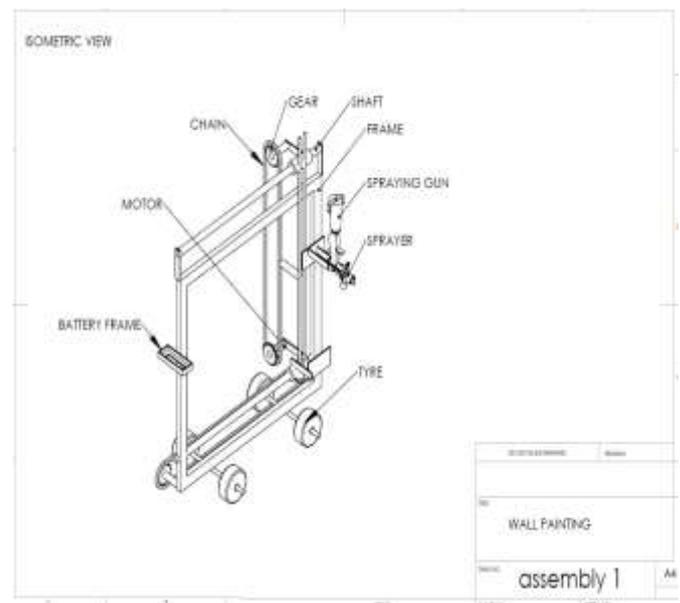
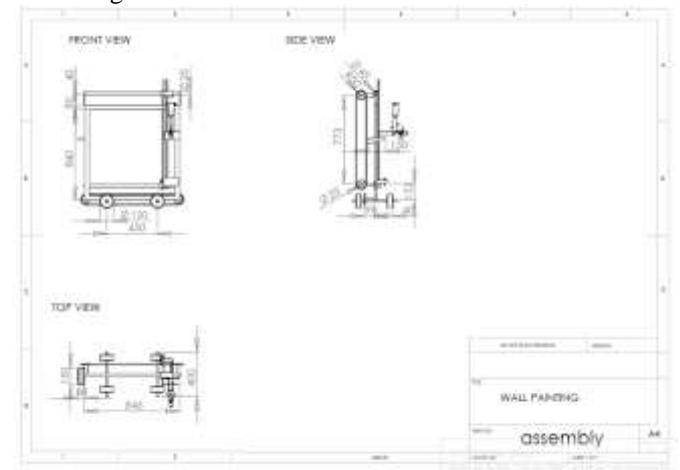
Apply a coat of wall primer. Use Decoprime Wall Primer (solvent thinnable) on absorbent surfaces and use Decoprime Wall Primer (water thinnable) on new surfaces. Fill and level the minor undulations of wall by applying putty. For best results, use Asian Paints Acrylic Wall Putty. In case of major undulations on the wall surface, POP (Plaster of Paris) work needs to be carried out. Ensure that the surface is uniformly smooth by sanding after POP or putty work. One liberal coat of Decoprime Wall Primer (solvent thinned or water thinned) is recommended on puttied areas before the application of top coat. The primer should be allowed to dry for 10 - 12 hours. If the primer coat is not applied over the puttied areas, there can be a patchy appearance of the top coat. Avoid application of putty or filling compound while painting exterior surfaces. Fill up cracks with a 1:3 (by volume) cement and sand mixture. All external drainage pipes must be checked for rusting or leakage. Any faulty plumbing must be rectified. Special attention must be given to the roof. Check for cracks

near the edges and close to the water reservoirs. Proper masonry or waterproofing work on the ceiling will enhance the performance of the paint. Painting for exterior walls.

##### Surface preparation

Newly plastered surfaces must be allowed to cure for at least 35 to 45 days before painting. To ensure long protection, the surface to be painted should be free from dust, grease and any loose materials. Remove any fungus and algae growth thoroughly by brushing it vigorously with wire brush and then cleaning it with bleaching powder solution in water (dissolve 10% bleaching powder in 1 litre of water, filter the solution and apply with a brush or sponge). This treatment should be done with greater care on the top of the awnings, sunshades, parapets and other horizontal surfaces where water is likely to accumulate during monsoon.

Block Dig:-



Result:-



costs. Savings resulting from the use of this device will make it pay for itself with in short period of time & it can be a great companion in any field dealing with rusted and unused metals. The device affords plenty of scope for modifications, further improvements & operational efficiency, which should make it commercially available & attractive. If taken up for commercial production and marketed properly, we are sure it will be accepted.

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#### V. CONCLUSION

We have taken up this project as real challenge, as we were not experience in the field. We started our work on this project facing new hurdles initially. After the completion of the project work we tried its working in our college machine shop and we were pleased to note that it does meet the requirements for what it is meant. The maneuverability of the device is quite good and the handling is quite simple. For commercial purpose one can improve the efficiency of the device effectively by increasing the size of the device. We feel the project that we have done has a good future scope in global SECTOR. The main constraint of this device is the high initial cost but has low operating