CEILING, INTERNAL AND EXTERNAL WALL RENDER FINISHING MACHINE

FIELD OF INVENTION:

Present invention relates to the field of construction industry & discloses a novel render finishing machine. More particularly, present invention relates to a novel render finishing machine for finishing internal wall, ceiling & external wall plaster.

BACKGROUND OF THE INVENTION:

Plastering in the construction business has long been dependent on manual application & requires skilled applicators to finish the render. The conventional manual type of application & finishing technique for plastering the walls, is where the labors use their hand and some instruments like flat board, mortar splashing tools and some flat surface trowel made of metal, wood or plastic for finishing of the substrate, wherein the mortar mix, which is to be plastered is manually spread or splashed on the substrate to be plastered and then the skilled labor works meticulously to level the surface using the flat trowel. This age old technique not only requires skilled workmanship, but is time consuming; leading to low output per man-day & causes excessive wastage of plastering material, time and therefore escalates the cost.

To overcome these challenges, a number of modern techniques have been deployed, such as the ‘Spray Plastering Machine’, which has the capability of mixing the ready mix mortars and spraying on the substrates to be plastered. The delivery point is large and the system has advantages such as the minimum need for material handling, mixing, extensive spraying capability tirelessly, speed for mortar spread, thereby saving time; reduced labor requirements, lower material wastage & low labor costs.

However some of the limitations of the above mentioned ‘Spray plastering machine’ are that sophisticated machinery requires technically qualified personnel to operate it; any

breakdowns in the machine, brings the work to a grinding halt; users may lack suitable infrastructural facilities at site; it requires skilled labor to finish the substrate; once the mortar is sprayed at speed which is a very big challenge, more so when the modern ready mix mortar are not easily workable when fresh.

To overcome the above mentioned problems, a further improvisation of the plastering process is the 'Automatic Plastering & Finishing Machine' wherein the machine does the mortar application on the substrate as well as the leveling & finishing application.

Some major advantages associated with this automatic machine are lesser labor requirements; time saving as the application & finishing is done simultaneously; improved speed of work and cost saving.

However some more limitations of the said fully-automatic machines apart from those enlisted above such as complex machinery & sophistication, are:

- Manual loading of mortar, and the method of loading for elevated height plastering;
-Too much of sensitivity as all functions of machine need to work simultaneously;
-Time consuming initial setting up of the machine when starting on a fresh surface application; and
- At times it may be difficult to obtain the desired even surface due to the technical limitation in the machine.

Some of the non-limiting background prior arts in this area include CN2627128Y, CN201033939Y, CN201292655Y, WO2003104584A1, CN104110121A, CN105888216B, and IN-201841006203.

After careful study, it is evident that not only are these disclosed systems / machines structurally dissimilar to present invention, but also vary in their operating processes and functionalities.

For eg, Prior art US3348342A describes an apparatus for finishing the side wall surfaces of walls comprising, in combination: a frame; a pair of housing assemblies secured beneath said

frame in spaced relation so as to straddle a wall, each of said housing assemblies having finishing means attached thereto for finishing at least one of
said surfaces. However it is limited to side wall applications. Whereas present invention provides mechanism for plastering of internal / external walls as well as the ceiling.

Another fairly older prior art US916811A discloses a plastering machine, a framework, slides mounted in said framework, means for guiding said slides in their movement, a supporting frame secured to said slides, trowels connected with said supporting frame, and a spring for yieldingly holding said trowels to their work. It is associated with a moving hopper adapted to receive plaster. Again, present system is functionally dissimilar to both US3348342A as well as US916811A as it only finishes & does not automatically apply mortar.

One more non-limiting prior art CN203066488U discloses a sixteen-wheel finishing machine tackle & comprises of an upper structure frame, a lower structure frame, a left structure frame and a right structure frame that are connected by flat flanges and bolts to form a sleeve type steel structure frame.
In contrast, present invention has a much simpler support frame comprising of four columns firmly fixed at right angles to the trolley. It envisages a suitable locking arrangement to align and lock firmly between floor and roof. Also it will have provision to ensure smooth traversing of saddle vertically, through a ball screw assembly drive and a telescopic frame to suit varying height adjustment. A similar arrangement has been provided for ceiling finishing wherein the trolley will traverse along the track with electrically driven wheels to the said trolley.

Indian patent application 201741006023 provides a self-powered automatic plastering machine for plastering walls by applying a mixture of cement, water and sand mortar on to a substantially plane surface.
While prior art 2408/CHE/2015 discloses a powered Manual Plastering machine operated manually for performing plastering on brick wall or concrete wall to create smooth coating.

The equipment consists of frame body made with base frame attached with height adjusting poles and top frame.

With respect to the above listed prior arts, the learned examiner will appreciate some of the unique features disclosed in present invention, which are:

- Present invention is a machine that only finishes and does not apply mortar;
- Provides solution for internal wall application, ceiling and external wall;
- Can obtain different surface finishes with equal ease;
- Requires very little skill and training and minimum sophistication for operation;
- A number of accessories for various application requirements can be easily included;
- Near to Zero wastage of raw material;
- Ease of handling at site & easy to adapt for different heights;
- Less skill required to adapt the technology; and
- Provides routine methodology to check for the accuracy of work.
-Minimum set up and down time
-Easy plane alignment due to fixed rail arrangement
-very convenient to achieve right angle corners
- due to the roller arrangement, all trapped air is relieved from the mortar on substrate to give a good compacted wall surface without disturbing the modified mortar performers
- Transfer of different design surfaces possible at one stroke, at the time of surface finishing
- a very convenient arrangement of breaking the application process from finishing process, which can run concurrently at convenience at various points.
- convenient to collect the excess material, thereby having a near to zero housekeeping requirement while applying & finishing the plaster mortar.

Present invention not only addresses all the above concerns or limitations in the prior art but also provides for ease of handling the machine by an averagely skilled labor, while enabling nearly 15 times more output to that of the average output by a skilled mason.

It is amply evident that all of the above mentioned prior arts fail to describe the present invention completely, when studied individually, thus making it potentially novel with respect to the state of the art. Again, present invention provides for a simpler yet efficient design alternative to the available solutions mentioned above. There is no such cost effective machine available for the intended operation, making it a novel invention in its space. More importantly, presently there is no mechanized system available for finishing the ceiling & external surfaces of high rise buildings.

SUMMARY:

Present invention relates to a novel render finishing machine for finishing internal wall, ceiling & external wall plaster comprising of finishing tool; saddle; support frame; trolley; and guided track sets. Furthermore, present invention provides a system to ensure leveling & finishing the surface along extended length and height of the wall with ease and needs minimum setup and validation requirements.

More particularly, it provides a track guided mechanism (FIG 1), electrically driven to level the plaster sprayed on walls and roof in one plane at a rapid speed. The said system envisages a powered finishing tool mounted on a saddle. The said saddle will travel vertically on four guides, driven by an electric motor. These guides will be mounted on a trolley wherein the said trolley will move on a set of tracks for vertical & horizontal movements.

BRIEF DESCRIPTION OF THE DIAGRAMS:

FIG 01 depicts a posterior view of the desirable embodiment of present invention describing a typical wall plaster leveler.

FIG 02 provides for an anterior view of the same embodiment describing a typical wall plaster leveler.

FIG 03 is a diagonal side view of the said desirable embodiment of present invention & depicts the placement of hydraulic cylinder or mechanical system for finishing plate movement.

FIG 04 depicts a top view of the said wall plaster leveler arrangement.

FIG 05 describes another embodiment of present invention disclosing a ceiling plaster leveler system.

FIG 06 (a) depicts plan view of roof top mounted winch assembly while FIG 6 (b) depicts front elevation view of a typical roof top mounted winch assembly.

FIG 07 (a) depicts a plan view of ground mounted winch assembly while FIG 7 (b) depicts front elevation view of a typical ground mounted winch assembly

FIG 08 (a) depicts front elevation view of suspended platform with roller assembly while FIG 8 (b) depicts side view of suspended platform with roller assembly.

FIG 09 is a plan view of a typical outside wall plastering finisher assembly.

FIG 10 is a front elevation view of outside wall plastering finisher assembly.

FIG 11depicts an example embodiment for a typical internal wall plaster finishing.

Lastly, FIG 12 depicts a plan, front elevation & right side elevation view of an example embodiment for a typical ceiling plaster finishing.

All the figures are schematic, not necessarily to scale, and generally only show parts which are necessary in order to elucidate the envisioned embodiments, wherein other parts may be omitted or merely suggested. Like reference numerals refer to like elements specific to mentioned figure numbers as illustrated in tables below. Dimensions (if any) have been provided by means of example embodiment only.

Table 1: Details of part numbers in the annexed drawings of FIG 1 to FIG 5

Table 2: Details of part numbers in the annexed drawings of FIG 6 to FIG 10

Table 3: Details of part numbers in the annexed drawings of FIG 11

Table 4: Details of part numbers in the annexed drawings of FIG 12

TABLE 1

ITEM No.	DESCRIPTION
1	RAIL FOR SYSTEM TRAVEL
1.1	RAIL SLEEPER
1.2	RAIL SLEEPER LEVELING SCREW
1.3	SPLICE PLATE FOR SLEEPER JOINT
1.4	SPLICE PLATE FIXING SCREW
2	SWIVEL WHEELS ASSEMBLY FOR SYSTEM MOVEMENT
3	FLOOR JACKING SCREW ASSEMBLY
4	FLOOR AND ROOF JACKING SCREW ASSEMBLY
4.1	SCREW
4.2	TURNBUCKLE
4.3	SCREW
5	GEARED MOTOR ASSEMBLY
5.1	COUPLING
5.2	SHAFT
6	HYDRALIC CYLINDER FOR SYSTEM LOCKING
7	SYSTEM WHEELS ASSEMBLY ON RAIL
8	PLASTER FINISHING ROLLER
9	GEARED MOTOR ASSEMBLY
9.1	RUBBER WHEELS FOR ROLLER MOVEMENT
9.2	SHAFT FOR RUBBER WHEELS MOUNTING
10	PLASTER FINISHING PLATE
11	EXCESS PLASTER MATERIAL COLLECTION TROUGH
12	RACK FOR PINION
13	PINION FOR VERTICAL TRAVEL
14	GUIDE WHEEL FOR VERTICAL TRAVEL
15	HYDRALIC CYLINDER FOR FINISHING PLATE MOVEMENT
16	ROLLER SHAFT HOLDING ASSEMBLY
17	FINISHER PLATE LOCKING ASSEMBLY ON SHAFT
18	SYSTEM PLUMB
19	MOTOR SHAFT BEARING HOUSING
20	WASTE PLASTER COLLECTION TROUGH
21	SPROCKET & CHAIN ASSEMBLY
22	BEARING HOUSING
23	ROLLER SYSTEM MOVEMENT LEAD SCREW
24	LEAD SCREW HAND WHEEL
25	HYDRAULIC CYLINDER FOR SYSTEM UP DOWN MOVEMENT
26	EXCESS MATERIAL REMOVAL DRAIN PIPE

~~Table 1~~

LEGEND	
ITEM No.	DESCRIPTION
1	DRIVE TROLLEY FRAME.
2	WINCH MOTOR.
3	WINCH GEAR BOX DRIVE.
4	STEEL ROPE WINDING WINCH.
5	ROPE PULLEY.
6	STEEL WIRE ROPE.
7	PULLEY FIXING STRUCTURE.
8	ROPE GUIDE PULLEYS.
9	COUNTER BALANCE DEAD WEIGHT.
10	WINCH STRUCTURE.
11	WINCH MOTOR.
12	WINCH GEAR BOX DRIVE.
13	STEEL ROPE WINDING WINCH.
14	WIRE ROPE GUIDE PULLEYS.
15	STEEL WIRE ROPE.
16	SUSPENDED PLATFORM ALUMINUM STRUCTURE.
17	WIRE ROPE GUIDE PULLEYS.
18	ROLLER & FINISHER PLATE ASSEMBLY MOVING TROLLEY.
19	ROLLER & FINISHER PLATE ASSEMBLY.
20	PIPE ROLLER.
21	FINISHER PLATE.
22	ROLLER GEAR BOX & MOTOR DRIVE.
23	ROLLER AND FINISHER PLATE ASSEMBLY FORWARD AND REVERSE MOVEMENT MOTORISED SCREW
24	ROLLER ASSEMBLY GUIDE RODS WITH SLEEVE.
25	ROLLER & FINISHER PLATE ASSEMBLY UP DOWN MOVEMENT BALL SCREW GEAR BOX WITH DRIVE.
26	RUBBER WHEELS.
27	CONCRETE ANCHOR DRIVE.

~~Table 2~~

LEGEND	
ITEM No.	DESCRIPTION
1	FINISHING ROLLER.
2	FINISHING PLATE.
3	FINISHING ROLLER DRIVE SPROCKET.
4	CEILING JACKING SCREW.
5	CEILING JACKING SCREW LOCKING ARRANGEMENT.
6	RAIL LOCKING SYSTEM.
7	RAIL LOCKING SYSTEM ADJUSTING NUT.
8	TELESCOPIC UP DOWN MOVING STRUCTURE.
9	TELESCOPIC UP DOWN MOVEMENT BALL SCREW ARRANGEMENT.
10	BALL SCREW BEARING WITH HOUSING.
11	LEVELING SCREW.
12	RAIL FOR SYSTEM MOVEMENT.
13	TELESCOPIC CARRIAGE MOVEMENT BALL SCREW.
14	BALL SCREW GEAR BOX WITH MOTOR.
15	SOLENOID FOR FORWARD BACKWARD MOVEMENT OF CARRIAGE.
16	SOLENOID WITH CLAMP FOR PLATE ANGULAR MOVEMENT.
17	BOTTOM JACKING SCREW.
18	CASTOR WHEELS FOR SYSTEM MOVEMENT.

~~Table 3~~

LEGEND	
ITEM No.	DESCRIPTION
1	RAIL FOR TROLLEY HORIZONTAL TRAVEL.
2	LEVELING SCREW.
3	'V' GROOVE WHEELS.
4	TRAVEL TROLLEY STRUCTURE.
5	40Ø BALL SCREW SHAFT.
6	BALL SCREW SHAFT HOLDING BEARINGS.
7	BALL SCREW SHAFT GEARED DRIVE.
8	TIMER BELT PULLEYS.
9	TELESCOPIC MOVING COLUMN FIXED STRUCTURE
10	TELESCOPIC MOVING COLUMN VERTICAL MOVING STRUCTURE
11	TELESCOPIC MOVING COLUMN BALL SCREW SHAFT.
12	TELESCOPIC MOVING COLUMN BALL SCREW SHAFT HOLDING BEARINGS.
13	TELESCOPIC MOVING COLUMN BALL SCREW GEARED DRIVE.
14	FINISHING ROLLER AND PLATE ASSEMBLY.
15	FINISHING ROLLER GEARED DRIVE.
16	SOLENOID WITH CLAMP FOR PLATE ANGULAR MOVEMENT.
17	EXCESS CONCRETE COLLECTION HOPPER.
18	TELESCOPIC MOVING COLUMN LINEAR BEARING GUIDES.
19	TELESCOPIC MOVING COLUMN WHEELS.
20	TELESCOPIC MOVING COLUMN WHEEL TRACK.

~~Table 4~~

ITEM NO.	DESCRIPTION
1	RAIL FOR SYSTEM TRAVEL
1.1	RAIL SLEEPER
1.2	RAIL SLEEPER LEVELING SCREW
1.3	SPLICE PLATE FOR SLEEPER JOINT
1.4	SPLICE PLATE FIXING SCREW
2	SWIVEL WHEELS ASSEMBLY FOR SYSTEM MOVEMENT
3	FLOOR JACKING SCREW ASSEMBLY
4	FLOOR AND ROOF JACKING SCREW ASSEMBLY
4.1	SCREW / BALL SCREW GUIDE
4.2	TURNBUCKLE
4.3	SCREW / 2 ND BALL SCREW GUIDE
5	GEARED MOTOR ASSEMBLY
5.1	COUPLING
5.2	SHAFT
6	HYDRAULIC CYLINDER FOR SYSTEM LOCKING
7	SYSTEM WHEELS ASSEMBLY ON RAIL
8	PLASTER FINISHING ROLLER
9	GEARED MOTOR ASSEMBLY
9.1	RUBBER WHEELS FOR ROLLER MOVEMENT
9.2	SHAFT FOR RUBBER WHEELS MOUNTING
10	PLASTER FINISHING PLATE
11	EXCESS PLASTER MATERIAL COLLECTION TROUGH
12	RACK FOR PINION
13	PINION FOR VERTICAL TRAVEL
14	GUIDE WHEEL FOR VERTICAL TRAVEL
15	HYDRAULIC CYLINDER FOR FINISHING PLATE MOVEMENT
16	ROLLER SHAFT HOLDING ASSEMBLY
17	FINISHING PLATE LOCKING ASSEMBLY ON SHAFT
18	SYSTEM PLUMB
19	MOTOR SHAFT BEARING HOUSING
20	WASTE PLASTER COLLECTION TROUGH
21	SPROCKET AND CHAIN ASSEMBLY
22	BEARING HOUSING
23	ROLLER SYSTEM MOVEMENT LEAD SCREW
24	LEAD SCREW HAND WHEEL
25	HYDRAULIC CYLINDER FOR SYSTEM UP DOWN MOVEMENT
26	EXCESS MATERIAL REMOVAL DRAIN PIPE

TABLE 2

ITEM NO.	DESCRIPTION
1	DRIVE TROLLEY FRAME
2	WINCH MOTOR
3	WINCH GEAR BOX DRIVE
4	STEEL ROPE WINDING WINCH
5	ROPE PULLEY
6	STEEL WIRE ROPE
7	PULLEY FIXING STRUCTURE
8	ROPE GUIDE PULLEYS
9	COUNTER BALANCE DEAD WEIGHT
10	WINCH STRUCTURE
11	WINCH MOTOR
12	WINCH GEAR BOX DRIVE
13	STEEL ROPE WINDING WINCH
14	WIRE ROPE GUIDE PULLEY
15	STEEL WIRE ROPE
16	SUSPENDED PLATFORM ALUMINUM STRUCTURE
17	WIRE ROPE GUIDE PULLEYS
18	ROLLER AND FINISHING PLATE ASSEMBLY MOVING TROLLEY
19	ROLLER AND FINISHER PLATE ASSEMBLY
20	PIPE ROLLER
21	FINISHER PLATE
22	ROLLER GEAR BOX AND MOTOR DRIVE
23	ROLLER AND FINISHER PLATE ASSEMBLY FORWARD AND BACKWARD MOVEMENT MOTORISED SCREW
24	ROLLER ASSEMBLY GUIDE ROD WITH SLEEVE
25	ROLLER AND FINISHER PLATE ASSEMBLY UP DOWN MOVEMENT BALL SCREW GEAR BOX WITH DRIVE
26	RUBBER WHEELS
27	CONCRETE ANCHOR DRIVE

TABLE 3

ITEM NO.	DESCRIPTION
1	FINISHING ROLLER
2	FINISHING PLATE
3	FINISHING ROLLER DRIVE SPROCKET
4	CEILING JACKING SCREW
5	CEILING JACKING SCREW LOCKING ARRANGEMENT
6	RAIL LOCKING SYSTEM
7	RAIL LOCKING SYSTEM ADJUSTMENT NUT
8	TELESCOPIC UP DOWN MOVING STRUCTURE
9	TELESCOPIC UP DOWN MOVING BALL SCREW ARRANGEMENT
10	BALL SCREW BEARING WITH HOUSING
11	LEVELING SCREW
12	RAIL FOR SYSTEM MOVEMENT
13	TELESCOPIC CARRIAGE MOVEMENT BALL SCREW
14	BALL SCREW GEAR BOX WITH MOTOR
15	SOLENOID FOR FORWARD AND BACKWARD MOVEMENT OF CARRIAGE
16	SOLENOID WITH CLAMP FOR PLATE ANGULAR MOVEMENT
17	BOTTOM JACKING SCREW
18	CASTOR WHEELS FOR SYSTEM MOVEMENT

TABLE 4

ITEM NO.	DESCRIPTION
1	RAIL FOR TROLLEY HORIZONTAL TRAVEL
2	LEVELING SCREW
3	V GROOVE WHEELS
4	TRAVEL TROLLEY STRUCTURE
5	BALL SCREW SHAFT
6	BALL SCREW SHAFT HOLDING BEARINGS
7	BALL SCREW SHAFT GEARED DRIVE
8	TIMER BELT PULLEYS
9	TELESCOPIC MOVING COLUMN FIXED STRUCTURE
10	TELESCOPIC MOVING COLUMN VERTICAL MOVING STRUCTURE
11	TELESCOPIC MOVING COLUMN BALL SCREW SHAFT
12	TELESCOPIC MOVING COLUMN BALL SCREW SHAFT HOLDING BEARINGS
13	TELESCOPIC MOVING COLUMN BALL SCREW GEARED DRIVE
14	FINISHING ROLLER AND PLATE ASSEMBLY
15	FINISHING ROLLER GEARED DRIVE
16	SOLENOID WITH CLAMP FOR PLATE ANGULAR MOVEMENT
17	EXCESS CONCRETE COLLECTION HOPPER
18	TELESCOPIC MOVING COLUMN LINEAR BEARING GUIDES
19	TELESCOPIC MOVING COLUMN WHEELS
20	TELESCOPIC MOVING COLUMN WHEELS TRACK

BRIEF DESCRIPTION:

Present invention relates to a novel render finishing machine for finishing internal wall, ceiling & external wall plaster. The said system provides for a dual leveling & finishing tool. The roller will firstly help the excess mortar sprayed to be leveled as well as make the mortar free flowing which gets planed by the blade to a clean finish, while moving vertically and/or horizontally.

More particularly, it provides a track guided mechanism (FIG 1), electrically driven to level the plaster sprayed on walls and roof in one plane at a rapid speed. In a typical embodiment, the said system envisages a powered finishing tool mounted on a saddle. The said saddle will travel vertically on four guides, driven by an electric motor. These guides will be mounted on a trolley wherein the said trolley will move on a set of tracks for vertical & horizontal movements.

For example, a typical embodiment of the said render finishing machine for finishing internal wall, ceiling & external wall plaster comprises of:

- FINISHING TOOL: It is envisaged that this will comprise of atleast one roller and atleast one leveling blade, mounted on a frame which will be mounted on the saddle by suitable means such as support brackets. The roller will be rotating at pre designed speed. This will be powered through a motor and a suitable gear box. This finishing tool will have provision to move horizontally at right angles to the wall. This will avoid any possible damage to the finished surface , while relocating the machine

- SADDLE: This will be a structure, which will be mounted on the Support frame. The said saddle will travel vertically, ensuring complete alignment with suitable guides with the wall. The movement of saddle will be achieved through a ball screw arrangement. The saddle will be mounted on a moving frame. This Moving frame will be of four columns. The said moving frame will be travelling in the fixed frame ensuring alignment through four linear guides. This movement will be powered by another set of Linear Ball Screw driven by a motor.

- MAIN FRAME / FIXED FRAME: It will comprise a plurality of columns, preferably four, firmly fixed at right angles to the trolley. It will have suitable locking arrangement to align and lock firmly between floor and roof. Additionally it will have provision to ensure smooth traversing of saddle vertically through suitable means. The system of one frame travelling in another is a unique feature of this invention. This telescopic arrangement in the machine ,will give many advantages over others like ease of maneuverability, flexibility to work on wall of any height (within it's range), no separate attachment , weight reduction ,etc A similar arrangement will be provided for ceiling finishing.

In a desirable embodiment of the invention, the said support frame may comprise of a plurality of columns, preferably four in number & firmly fixed at right angles to the trolley. Moreover, the said assembly may be a telescopic arrangement which will facilitate movement between rooms without hindrance and allow for room height adjustment without any on site assembly requirements. It will have suitable locking arrangement to align and lock firmly between floor and roof. Also it will have provision to ensure smooth traversing of saddle vertically, through suitable means such as ballscrew guided with linear bearings or a Rack and Pinion drive etc. A similar arrangement will be provided for ceiling finishing wherein the trolley will traverse along the track with electrically driven wheels to the trolley and move within a fixed ferry.

-TROLLEY: Present invention envisages that the said trolley will be a rigid rectangular frame with a plurality of wheels, typically four in number, & properly aligned to ensure a smooth travel in a straight line on the tracks. In a desirable embodiment, Screw jacks may be provided along with level gauges or Plumb bobs to check the level accuracies before doing the job.

-TRACK SETS: It will be made out of Rails or light weight angles laid parallel and firmly held, with the help of sleeper plates. Each set will have provision to ensure perfect leveling horizontally in longitudinal and lateral direction. Also it will have provision to lock the track set firmly between floor slab and the roof slabs.

It has also been envisaged that unlike the other machines available in the market, present invention may incorporate the following advanced technical features as described below as means of possible embodiments of present invention.

In one embodiment, the finishing of wall will be achieved with help of a specially designed tool plate and a revolving roller at high speed. This will give a smooth surface and allow free flowing material to spread & finish. Furthermore the finishing will be done in two steps viz. the Up-Stroke (leveling step) & Down-Stroke (the finishing step).

In the same or another embodiment, the said machine will be set on a pair of light weight quick fix rail tracks, specially designed for this machine. The said tracks will be leveled perfectly to achieve zero line level to the floor. This will allow the machine to finish the plastered surface at 90 deg to the desired finish plane, as it will be leveled horizontally in longitudinal and in the lateral direction. In a desirable embodiment, this leveling on the wall will be achieved with help of Laser Guiding Apparatus. The above will ensure verticality of the wall. Also the total wall will be in one plane, as the machine will be travelling on the rail track laid parallel to the wall and screw jacked to the floor & ceiling at the same point while finishing at a given point.

It is also envisaged that the machine need not be leveled every time, for the same wall surface. This will save time of the work force, besides increasing the output and achieve the desired parallel plane. Furthermore, the finished wall will be in one plane as the errors due to repeated leveling and alignment will be avoided automatically.

Present invention allows that various designs can be transferred onto the wall along with the finishing function simultaneously. For example, it is possible to attach different finishing tools with different application contours to the machine, circular, flat, square etc. Furthermore, the invention may also be suitably modified or converted to develop the system as a smart plastering tool with possibility of decision making from remote location and real time data sharing.

Having described an example embodiment along with some desirable features, it will also become apparent to a person skilled in the art that various modifications can be made to the system without departing from the scope of the invention as defined in this document & the drawings. For example, the external wall application may be suitable & interchangeably modified for the internal wall plastering by effecting suitable changes to the cabin within which the system has been installed.

It will thus be seen that the embodiments set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in carrying out the above method and in the construction set forth without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention, which, as a matter of language, might be said to fall there between.

ADVANTAGES:

Cost effectiveness: Near to zero wastage of construction material, near to zero house keeping requirements, minimum requirement for set up time and the need for frequently assessing the operational accuracy, better speed of output, Less dependency on skilled labor along-with more output per labor. Unskilled labor can also be employed to achieve better output & finish instead of a skilled labor. Minimum sophistication in machine design, therefore minimum on site maintenance requirements which is a very special feature in the machine design owing to the erratic and insufficient infra structural facility available at site. Designed to effectively work with the modified ready mix mortars largely available in the market as well as the conventional mortar system

Technical Superiority: Provides superior finish, thereby reducing the top coat requirements. It has a number of accessories that can be attached to the machine with ease to address a number of on- site requirements. Easily possible to control the thickness of application, thereby reducing the chances of material wastage arising out of excess thickness than required as the present system depends on human/manual finishing. The adjoining wall will always be at right angle. The machine is only a plaster finishing machine which is contrasting & different than any of the existing system. Also, there are no systems for finishing the ceiling & the external High Rise Buildings and that too without the need for any scaffolding. The machine does not require any adjustment for varying height requirements, as the system is working with a telescopic movement to the finishing tool.

INDUSTRIAL APPLICABILITY:

Present invention can easily be deployed in all construction activities involving plastering of Internal & external walls or ceilings. Present innovation has promises for bringing about a paradigm shift in the manner plastering has been hitherto done. This will change the entire outlook of the final client, contractors and other market intermediaries. Savings on account of this machine to the user are enormous and likely to excite new and existing market participants to copy our system.

It offers an excellent balanced alternative to the manual plaster rendering versus fully automated plastering options available in the market. Since it is an indigenously developed low cost, low skill, better output system, this is also in line with the government's 'Make in India' initiative.

Applicant: Mr Satish Patil, 38 Electronic Industrial Estate, Opp City Pride, Pune Satara Road, Pune 411 009, India, an Indian Citizen.

CLAIMS

I claim:

1. A ~~novel~~ render finishing machine for finishing internal wall, ceiling & external wall plaster,

characterized in that,

the render finishing machine comprises~~ing~~ of~~-~~:

finishing tool~~,~~; saddle~~;~~, main frame~~,~~; trolley~~,~~; and track sets;

wherein the render finishing machine~~it~~ provides track guided mechanism for the finishing tool, electrically driven to level the plaster sprayed on walls and ceiling in one plane at a rapid speed;

the said ~~powered~~ finishing tool comprises of an at least one roller (8) and an at least one leveling blade (10), mounted on ~~a~~the saddle which will travel vertically on a plurality of guides, driven by an electric motor (5, 9);~~,~~ and

~~1.~~ the said guides being mounted on ~~a~~the trolley which can move on a set of tracks for vertical & horizontal movements.

2. The~~A novel~~ render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim 1, wherein the said finishing tool with the ~~may comprise of~~ at least one roller (8) and the at least one leveling blade (10), mounted on the saddle by ~~suitable means such as~~ support brackets; the said ~~support~~main frame may comprise a plurality of columns firmly fixed at right angles to the trolley alongwith a~~suitable~~ locking arrangement to align and lock firmly between floor and roof; a rigid rectangular frame trolley with a plurality of wheels aligned to ensure a smooth travel in a straight line on ~~the~~ tracks in the set of tracks with means to provide screw jacks (4) along with level gauges or plumb (18) bobs to check the level accuracies before doing the job; & the track sets made out of rails or light weight angles laid parallel and firmly held, with the help of sleeper plates with provision to ensure perfect leveling horizontally in longitudinal and lateral direction as well as a provision to lock the track set firmly between floor slab and the roof slabs.

3. The~~A novel~~ render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim 1 ~~&~~or 2 provided with means to ensure smooth traversing of saddle vertically through ~~suitable means such as but not limited to~~ ball screw (4.1, 4.3) guided with linear bearings or a rack (12) and pinion (13) drive ~~etc~~ as well as ~~suitable~~ means for ceiling finishing wherein the trolley will traverse along the track in the set of tracks with electrically driven wheels to the trolley and move within a fixed ferry~~. Preferably, the movement of saddle will be achieved through a ball screw arrangement & the said saddle will be mounted on a moving frame comprising of four columns such that the said moving frame will be travelling in the fixed frame ensuring alignment through four linear guides; wherein this particular movement will be powered by another set of linear ball screw driven by a motor~~.

4. The~~A novel~~ render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim 1, wherein~~,~~ the said ~~support~~main frame may comprise of a plurality of columns, firmly fixed at right angles to the trolley such that the said ~~assembly~~main frame may be a telescopic arrangement which will facilitate seamless movement between rooms without hindrance and allow for room height adjustment without any on site assembly requirements.

~~5. A process of render finishing for internal wall, ceiling & external wall plaster, using the novel machine as claimed in claim 1 wherein,~~

~~the finishing of wall will be achieved with help of a specially designed tool plate and a revolving roller at high speed to give a smooth surface and allow free flowing material to spread & finish; & wherein~~

~~preferably the finishing will be done in two steps viz. the Up-Stroke or a leveling step & the Down-Stroke or the finishing step.~~

~~6.~~5. The~~A novel~~ render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim 1, wherein~~,~~ the said machine will be set on a pair of light weight quick fix rail tracks (1), specially designed for this machine; leveled perfectly to achieve zero line level to the floor with means so that the said leveling on the wall may be achieved with help of Laser Guiding Apparatus.

~~7.~~6. The~~A novel~~ render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim 1, ~~& 5~~ wherein~~,~~ the machine need not be leveled every time, for the same wall surface.

~~8.~~7. The~~A novel~~ render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim ~~1~~2, wherein~~,~~ it is possible to attach different finishing tools to the machine with different application contours including ~~to the machine,~~ circular, flat, square or the like~~etc.~~ mounted on a frame which will be mounted on the saddle by ~~suitable means such as~~ support brackets such that the said roller (8) will be rotating at pre designed speed ~~& will be preferably powered through a motor and a suitable gear box~~.

8. The~~A novel~~ render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim 1, wherein~~,~~ the invention may also be ~~suitable~~ modified or converted to develop the system as a smart plastering tool with possibility of decision making from remote location and real time data sharing.

9. The render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim 3 wherein the movement of saddle will be achieved through a ball screw (4.1, 4.3) arrangement & the said saddle will be mounted on a moving frame comprising of four columns such that the said moving frame will be travelling in the main frame ensuring alignment through four linear guides; wherein this particular movement will be powered by another set of linear ball screw driven by a motor (5, 9).

10. The render finishing machine for finishing internal wall, ceiling & external wall plaster as claimed in claim 8, wherein said roller (8) will be powered through a motor (5, 9) and a gear box.

11. A process of render finishing for internal wall, ceiling & external wall plaster, using the novel machine as claimed in claim 1, wherein the finishing of wall will be achieved with help of a specially designed tool plate (10) and a revolving roller (8) at high speed to give a smooth surface and allow free flowing material to spread & finish.

12. The process of render finishing for internal wall, ceiling & external wall plaster as claimed in claim 11, wherein the finishing will be done in two steps viz. the Up-Stroke or a leveling step & the Down-Stroke or the finishing step.

~~9.~~13. The process of render finishing for internal wall, ceiling & external wall plaster as claimed in claim 11 wherein, the machine need not be leveled every time, for the same wall surface.