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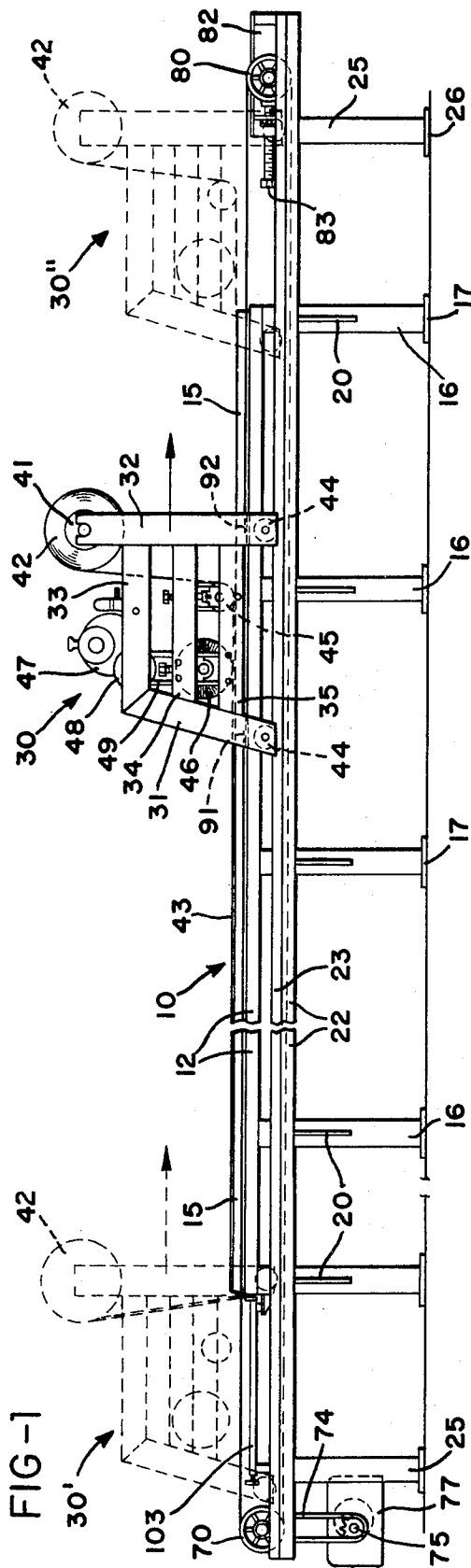
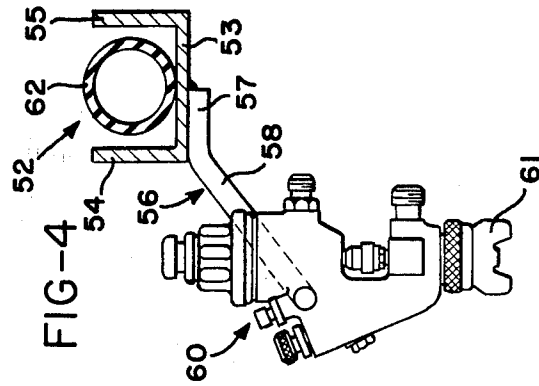
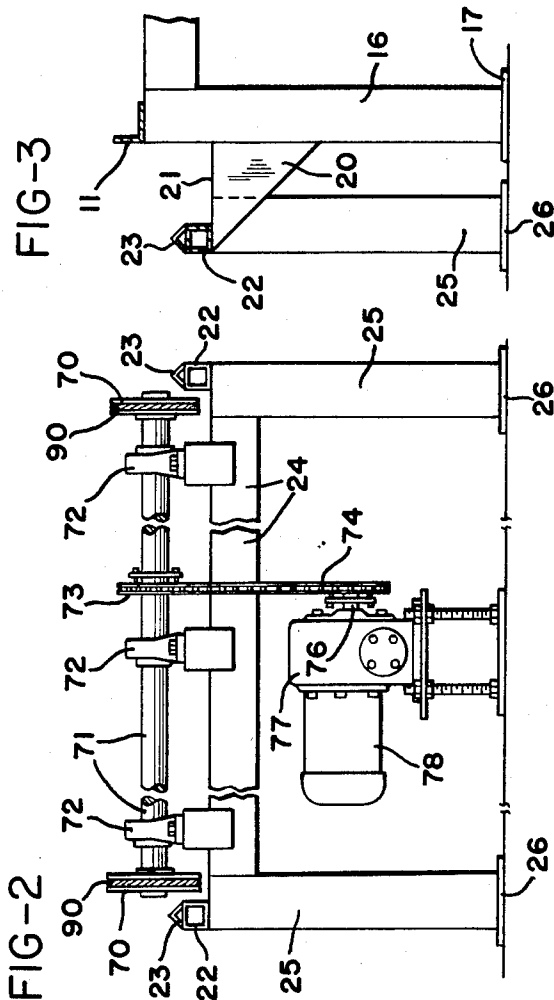
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3,671,362

WALL COVERING APPLICATOR

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2 Sheets-Sheet 1



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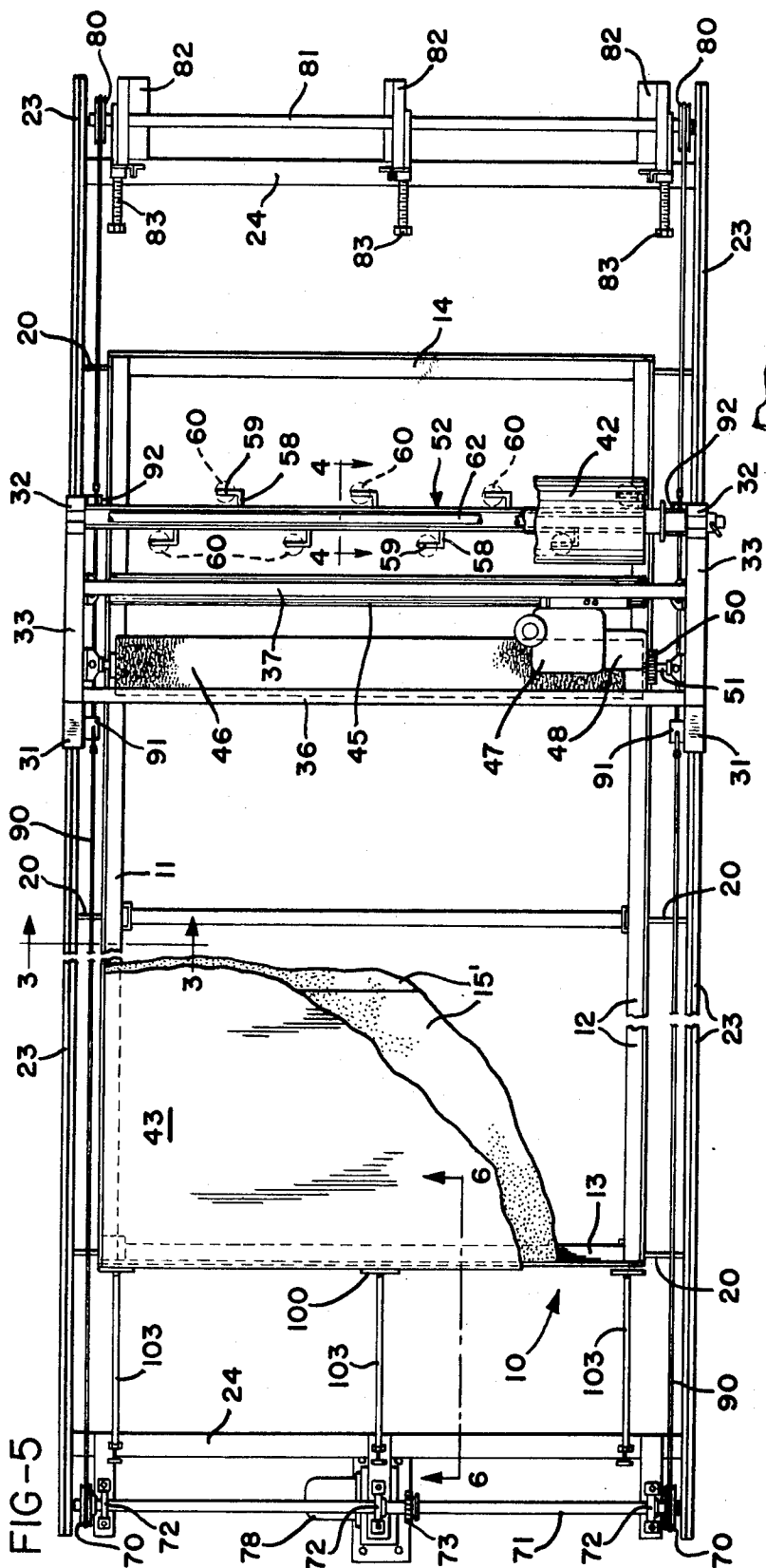
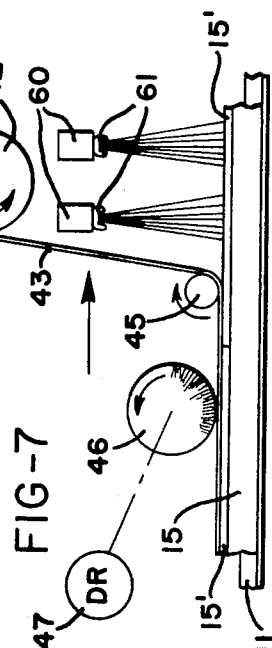


FIG-6

FIG-7

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WALL COVERING APPLICATOR

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2 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for applying a continuous sheet of a wall covering material to a wall panel includes a table for supporting the panel in a horizontally disposed position, and a carrier which carries a roll of the covering material, an adhesive spray system, and a machine driven rotatable brush. Rails extend along opposite sides of the table and are engaged by rollers on the carrier, which is moved along the rails by a cable and sheave arrangement. As the carrier moves along the rails, and hence, over the surface of the panel supported on the table, adhesive is sprayed on the panel upper surface, the sheet material is unrolled, and the rotating brush presses the sheet material against the adhesive covered panel surface.

BACKGROUND OF THE INVENTION

In conventional dry wall construction, whether the wall is constructed at the building site or in a factory remote from the site, usual practice is to tape the joints between adjacent wall boards of, for example, gypsum board, and then spackle the taped joint to provide a substantially continuous surface. Thereafter, the walls may be either painted or covered with a layer of wall paper.

A more recent development has been to adhesively secure to the exposed surfaces of the wall boards continuous sheets of a synthetic resinous material, such as polyvinyl chloride, which may be colored, embossed, or provided with a variety of other decorative finishes. In contrast to wall coverings of paint or wall paper, wall coverings of this type do not require taping and spackling of the joints between adjacent wall boards, since the wall covering itself is able to span the joints and effectively seal them without additional underlying joint structure. This approach has found particular advantage in construction systems which utilize factory assembled wall panels or assemblies of wall panels.

As noted above, one of the advantages of using wall coverings of the polyvinyl chloride type is that this type of covering effectively masks the joints in the underlying wall structure and provides a substantially continuous wall surface which is both aesthetically pleasing and relatively easy to keep clean. However, difficulties have been encountered in applying wall coverings of this type since the continuous sheet of wall covering is rather unwieldy and the operation of applying adhesive to either the undersurface of the wall covering or the exposed surface of the wall and then applying the wall covering to the wall surface, while avoiding air pockets, wrinkles, and the like, is a difficult operation and will ordinarily require the services of several people. As a result, the advantages of using this type of wall covering may be outweighed by the difficulties encountered in applying it as well as the increased labor costs which result.

SUMMARY OF THE INVENTION

In accordance with the present invention factory assembled wall panels are provided with a continuous covering of a synthetic resinous material, such as polyvinyl chloride, through the use of a machine which supports the

wall panel with its exposed surface horizontally disposed, applies a coating of adhesive to this surface and then adheres a continuous sheet of the wall covering material to the adhesive covered surface of the panel, while continuously smoothing the wall covering to prevent the formation of air pockets, wrinkles and the like.

The machine which accomplishes these results includes a panel supporting table having rails extending along its sides which are engaged by rollers on a carrier for transporting a roll of the wall covering material across the upper surface of the table. A cable and sheave arrangement is provided for moving the carrier along the rails as well as an adhesive spraying mechanism for coating the panel surface with a coating of adhesive, a turning roller for directing the wall cover onto the adhesive coated surface of the wall panel as the wall covering material is unrolled and a rotating brush which continuously smooths the wall covering to prevent the formation of air pockets, wrinkles and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

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

FIG. 2 is an elevation of the drive end of the apparatus;

FIG. 3 is a view taken on line 3—3 of FIG. 5;

FIG. 4 is a view taken on line 4—4 of FIG. 5;

FIG. 5 is a plan view of the apparatus shown in FIG. 1;

FIG. 6 is a view taken on line 6—6 of FIG. 5; and

FIG. 7 is a somewhat schematic representation showing the interrelationship of the components of the wall covering carrier.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference initially to FIGS. 1 and 5, it will be seen that apparatus according to the present invention includes a panel supporting table 10 having angle-shaped side rails 11 and 12 and end rails 13 and 14 extending between the ends of the side rails and attached thereto by welding or the like. The horizontal flanges of the angle members are disposed in coplanar relationship to receive a panel 15 and support the panel with one planar surface thereof horizontally disposed. Attached to the lower surface of the horizontal flanges of the end rails it will also be seen in FIG. 1 that a plurality of downwardly extending support legs 16 are provided attached to the lower surfaces of the horizontal flanges of the side rails and extending downwardly therefrom to terminate in base plates 17.

With continued reference to FIGS. 1 and 5, and additional reference to FIG. 3, it will be seen that each of the legs 16 has a substantially triangularly-shaped gusset 18 attached thereto by welding or the like and extending outwardly of the side rails 11 and 12. The gussets 20 have coplanar horizontal surfaces 21 to which are affixed box shaped track supports 22 positioned on either side of the panel supporting table and extending beyond the ends thereof. Each of the track supports carry V-shaped track members 23 and adjacent each end of each of the members 22 suitable cross-bracing, as at 24, is provided as well as downwardly extending legs 25 which terminate in base plates 26.

As best seen in FIGS. 1 and 5, a carrier 30 is mounted above the supporting table and includes pairs of downwardly extending legs 31 and 32, interconnecting struts 33, 34 and 35, and transversely extending cross bracings 36 and 37. The upper ends of the legs 32 are provided with substantially U-shaped slots 40 to accommodate the ends of a shaft 41 carrying a roll 42 of the wall covering material 43. Each of the legs 31 and 32 also has rotatably mounted at its lower end a roller 44 which is formed with

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a V-shaped groove complementary to the shape of the track 23 and engageable therewith.

Extending transversely of the carrier 30 and journaled adjacent each of their ends on the carrier are an idler turning roller 45 and a rotatable brush 46. Rotatable brush 46 is driven by a motor 47 through a gear reduction unit 48 and a drive chain 49 attached to a sprocket wheel 50 on one end of the shaft 51 carrying the rotatable brush 46.

Also extending transversely of the carrier 30 is a channel member 52 which, as best seen in FIGS. 4 and 5, is provided with a substantially horizontal web 53 and upstanding legs 54 and 55. Attached to the lower surface of the web 53 are a plurality of oppositely extending, angularly shaped rod members 56, each of which includes a horizontally oriented upper portion 57 attached to the lower surface of a web 53 by welding or the like, a downwardly extending medial portion 58 and a second horizontally extending portion 59.

A plurality of spray heads 60 having downwardly projecting nozzles 61 are positioned along the channel member 52 and receive the lower horizontal portions 59 of the rod members 56 in complementary sockets formed in each of the spray heads 60. The channel member 52 also serves as a support for an adhesive conveying conduit 62 which lays in the channel formed by the web 53 and upstanding legs 54 and 55 and is connected to each of the spray heads 60 by suitable cross conduits, not shown, and at one end thereof to any suitable source of adhesive.

Rotatably mounted adjacent one end of the tracks 23, the left-hand end as seen in FIGS. 1 and 5, are a pair of sheaves 70 attached to an axle 71 which extends across the machine and is rotatably mounted in suitable bearings, as at 72. Intermediate its ends the axle 71, as also seen in FIG. 2, is provided with a sprocket wheel 73 having a drive chain trained thereabout and about a second sprocket 75 mounted on the end of a drive shaft 76 of a gear reduction unit 77 operatively associated with a motor 78.

Adjacent the opposite end of the machine, the right-hand end as seen in FIGS. 1 and 5, are a pair of sheaves 80 mounted on a shaft 81 which extends across the machine and is journaled in the takeup devices 82, each of which are provided with screw threaded adjusting members 85 for varying the spacing between the axles 71 and 81 and hence, the spacing between opposing sheaves 70 and 80.

A pair of cables 90 have their opposite ends attached to tie plates 91 and 92 fixed by welding or the like to the interior surfaces of the legs 31 and 32, respectively, and projecting inwardly of the carrier. Intermediate each of their ends the cables 90 are trained about the drive sheaves 70 and the takeup sheaves 80 and maintained in a taut condition by means of the adjusting rods 83.

At the drive end of the machine, as best seen in FIGS. 1, 5 and 6, a series of clamp plates 100 are positioned in opposition to the upstanding flange 101 of the end rail 13. Each clamp plate 100 is affixed by welding or the like to one end of a rod member 102 which is slidably received in a tubularly shaped member 103. An internally threaded filler plug 104 is secured in one end of the tubular member 103 and threadedly receives a threaded push rod 105 provided with a handle 106. Each of the tubular members 103 is supported at one end by means of a gusset plate 107 attached to a cross member 108 extending across the support table and, adjacent its opposite end, by a mounting block 109 affixed to and extending upwardly from the cross brace 24.

In operation, a panel 15, which includes a plurality of subpanels 15' of gypsum board or the like attached to a suitable core, is placed on the support table 10 with the periphery of its lower surface resting on the coplanar horizontal flanges of the side and end rails 11 through 14 to thus support the panel with its planar upper surface

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exposed in a horizontal position. The carrier 30, bearing a roll 41 of covering material 43 rotatably mounted adjacent the upper ends of the legs 32, is positioned at the drive end of the machine as shown in phantom lines at 30' in FIG. 1 of the drawings.

A length of the wall covering material is then unrolled and trained about the turning roller 45 and beneath the rotatable brush 46 and clamped between the upstanding leg 101 of the end rail 13 and the clamp plates 100. Drive sprocket 75 is then energized, causing the sheaves 70 to turn in a clockwise direction as seen in FIG. 1, and move the carrier 30 across the table 10 and over the surface of the panel 15 supported thereby.

As the leading end of the carrier reaches the edge of the panel 15 the spray heads 60 are activated to apply a substantially continuous coating of adhesive to the exposed surface of the panel. Since one end of the wall covering material is clamped to the downstream end of the panel supporting table, as the carrier moves away from the drive end of the machine the wall covering material is unrolled and directed into contact with the adhesive covered surface of the panel 15 by the turning roller 45. The rotating brush 46 has its axis positioned with respect to the upper surface of the panel 15 a distance less than its radius so that the brush 46, as it is rotated by the drive mechanism 47 through 50, presses the wall covering against the surface of the panel while smoothing it and preventing the formation of air pockets, wrinkles and the like.

When the spray heads reach the end of the panel 15 the adhesive spraying operation is terminated while the drive sheaves 70 continue to move the carrier down to the takeup end of the machine shown in phantom lines at 30' in FIG. 1 of the drawings. At this time the carrier is stopped, the wall covering is severed along the edge of the panel 15, the panel removed from the table, and the sheave 70 reversed to return the carrier to the drive end of the machine to repeat the operation just described. In this regard it should be noted that for convenience of operation the above sequence of events will conveniently be controlled by an integrated control system which eliminates the necessity of manually actuating each of the elements in the proper sequence.

From the above it will be apparent that the present invention provides means for expeditiously applying a continuous wall covering to the exposed surface of a panel to provide a substantially continuous wall surface of pleasing appearance.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A wall covering applicator comprising:

- (a) a panel supporting table including a pair of spaced parallel side rails interconnected adjacent their ends by spaced parallel end rails,
- (b) support legs attached to and extending downwardly from said side rails,
- (c) gusset plates attached to said support legs and extending outwardly of said side rails,
- (d) a pair of spaced parallel tracks of substantially inverted V cross section mounted on said gusset plates outwardly of said side rails and extending beyond said end rails,
- (e) a carrier having:
 - (i) V groove wheels rotatably mounted thereon and engaging said tracks,
 - (ii) a flexible sheet material roll support,
 - (iii) means for applying adhesive to a panel supported on said table, and
 - (iv) a rotatable brush for pressing said flexible sheet materials from said roll to the adhesive

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covered surface of said panel supported on said table,

- (f) pairs of spaced, parallel sheaves mounted adjacent each end of said tracks,
 - (g) takeup means for varying the spacing between said pairs of sheaves, 5
 - (h) a pair of cables having opposite ends attached to said carrier and intermediate portions trained about said sheaves, and
 - (i) means for rotating one pair of said sheaves. 10
2. A wall covering applicator comprising:
- (a) a panel supporting table,
 - (b) track means disposed along opposite sides of said table outwardly thereof,
 - (c) a carrier extending transversely across said table and movable along said track, 15
 - (d) means for supporting a roll of flexible sheet material on said carrier,
 - (e) a turning roller rotatably mounted on said carrier adjacent the forward end thereof in closely spaced relationship to said table, 20
 - (f) a plurality of adhesive spray heads mounted on said carrier forwardly and above said turning roller at spaced intervals along said carrier,
 - (g) a rotatable brush mounted on said carrier adjacent said table rearwardly of said turning roller, 25
 - (h) motor means carried by said carrier for rotating said brush,

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- (i) sheave means rotatably mounted adjacent opposite ends of said table,
- (j) cable means having one end thereof attached to said carrier adjacent a forward end thereof, wrapping said sheave means at opposite ends of said table and attached to said carrier adjacent a rearward end thereof, and
- (k) means for rotating said sheave means to cause said carrier to traverse said tube longitudinally thereof.

References Cited

UNITED STATES PATENTS

3,522,132	7/1970	Cardis	156—523	X
2,873,789	2/1959	Ditter et al.	156—523	X
3,350,256	10/1967	Eckman et al.	156—523	X
2,291,691	8/1942	Caufman	156—494	
1,403,395	1/1922	Egleston	156—577	X
2,740,459	4/1956	Kilborn et al.	156—494	X
1,498,618	6/1924	Fritz	156—577	X
439,789	11/1890	McQueney	156—574	

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