

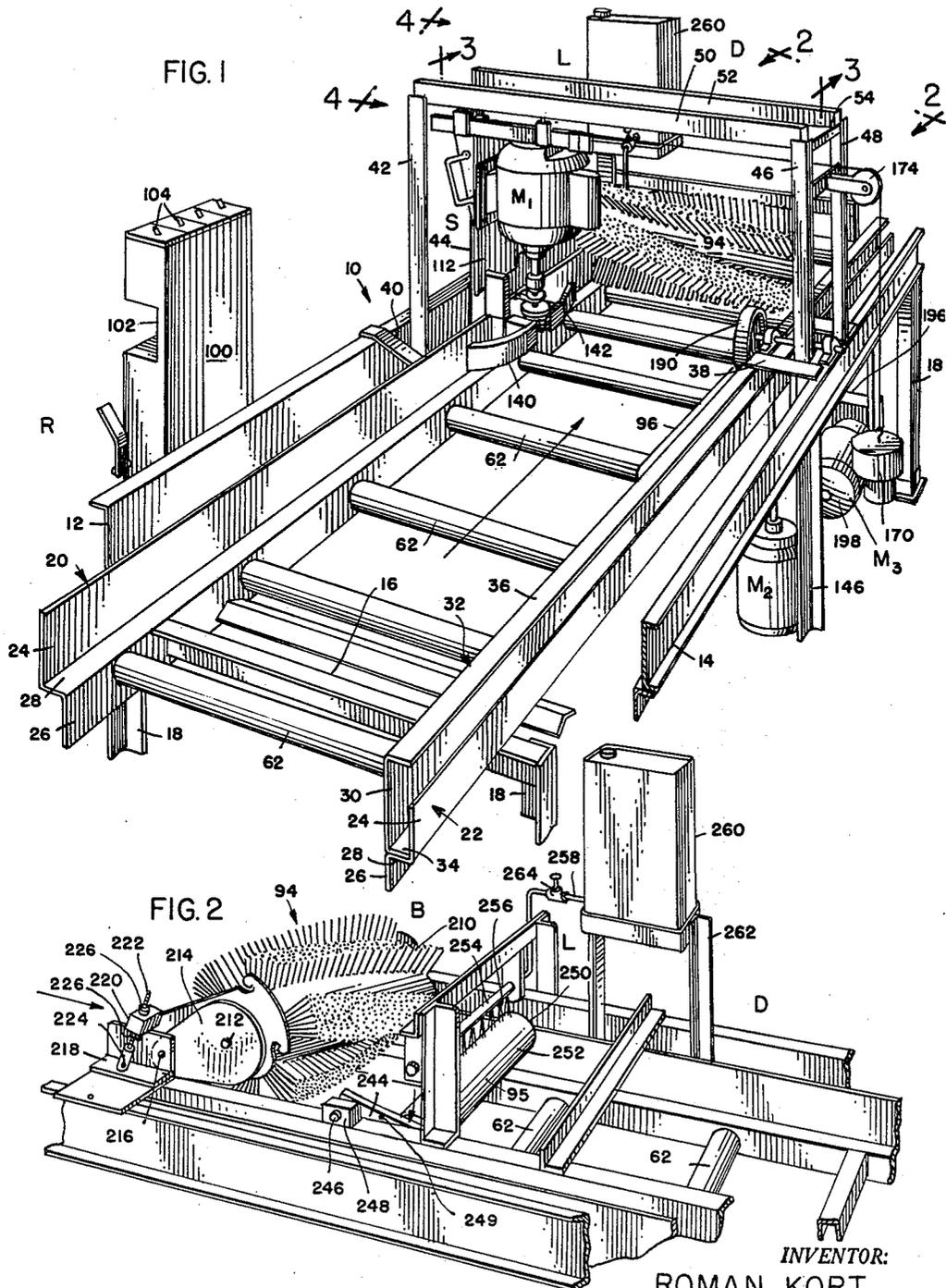
April 2, 1963

R. KORT
MACHINE FOR CLEANING AND RECONDITIONING
CONCRETE WALL FORM PANELS

3,083,388

Filed March 16, 1961

3 Sheets-Sheet 1



INVENTOR:
ROMAN KORT
BY *Norman Herlach*

ATT'Y

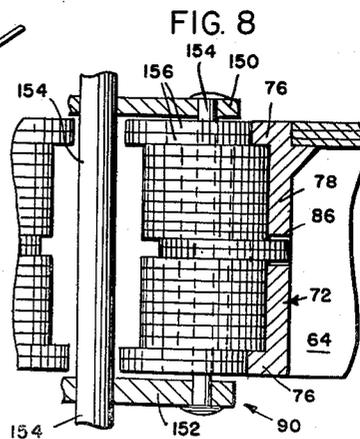
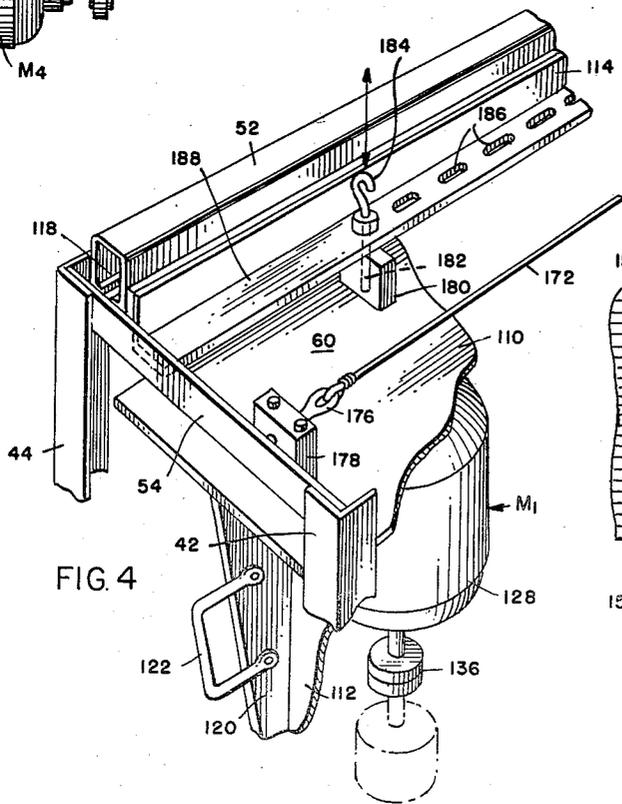
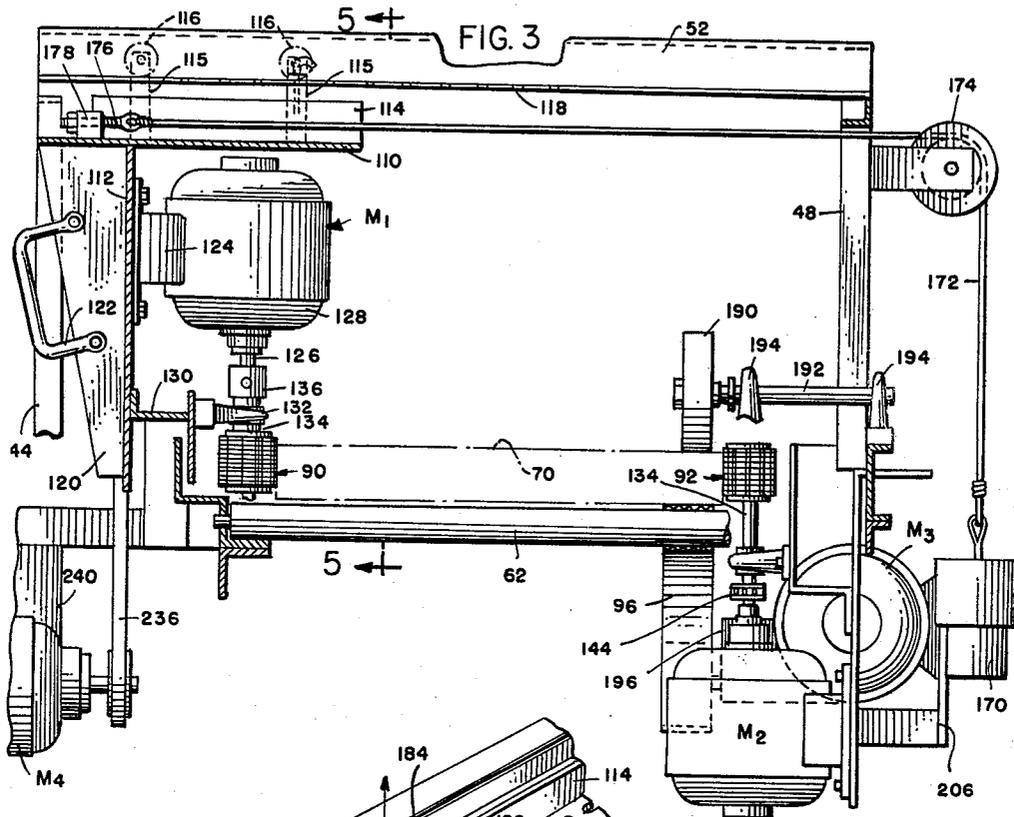
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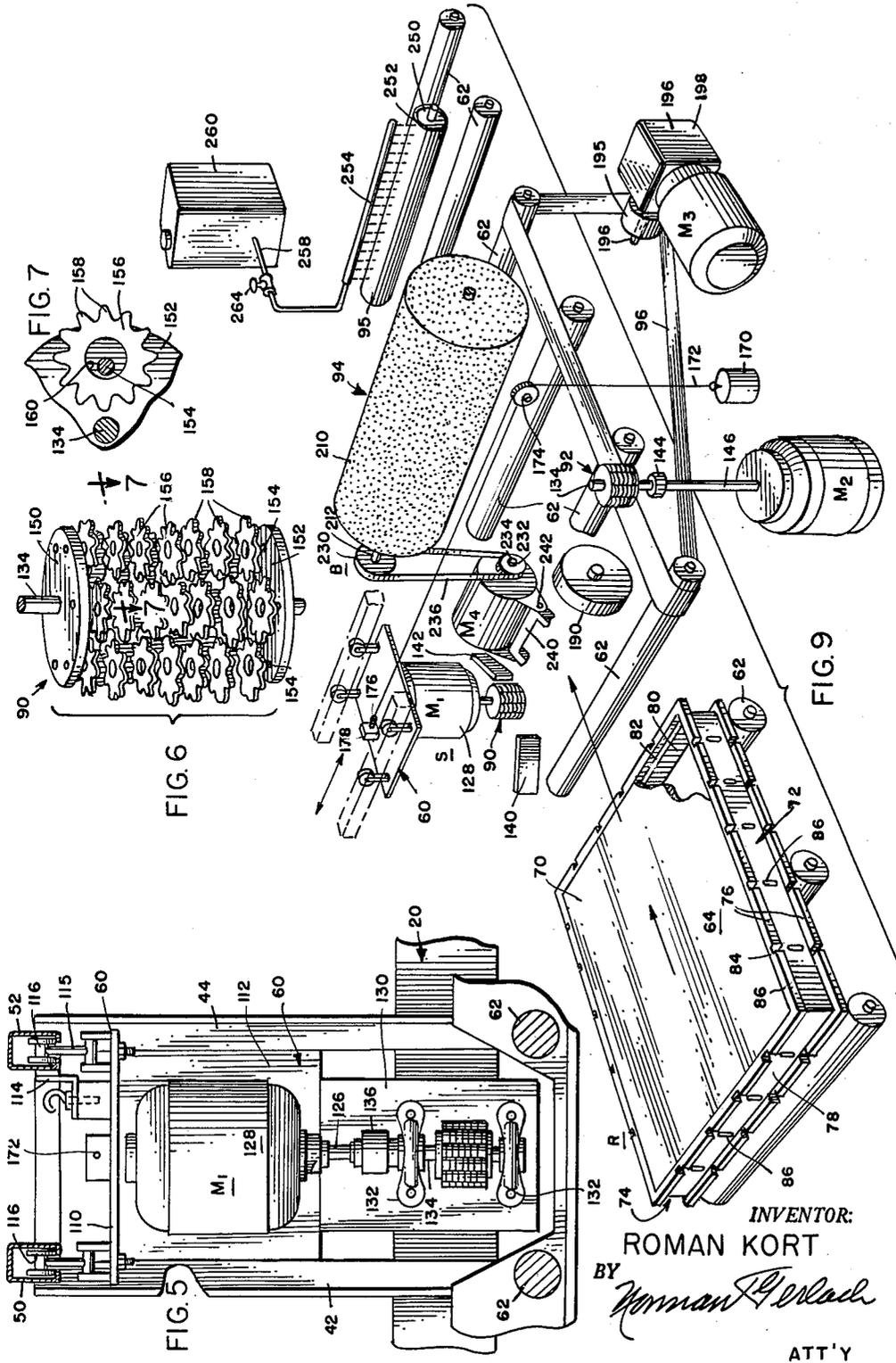
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INVENTOR:
ROMAN KORT
BY *Norman Gerlach*

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MACHINE FOR CLEANING AND RECONDITIONING CONCRETE WALL FORM PANELS

Roman Kort, River Forest, Ill., assignor to Symons Mfg. Company, a corporation of Delaware
 Filed Mar. 16, 1961, Ser. No. 96,182
 7 Claims. (Cl. 15-93)

The present invention relates to a machine for cleaning and reconditioning concrete wall form panels after they have been in service and preparatory to reusing them in a subsequent concrete wall form or other installation. More specifically, the invention is concerned with a panel-cleaning machine by means of which concrete form panels of the type commonly known as "Steel-Ply" panels may be divested of any concrete which may adhere to the plywood panel facings and to the marginal steel frame members associated therewith. The invention is, however, by no means limited to such use and a panel-scrubbing machine constructed in accordance with the principles of the present invention may be found useful in connection with concrete form panels other than "Steel-Ply" panels, for example, panels having metal panel facings, panels having wooden frame members, or filler panels, filler strips and a wide variety of other special make-up units. Irrespective of the particular use to which the present invention may be put, the essential features of the invention are at all times preserved.

"Steel-Ply" panels are widely used in industry and are manufactured and sold by Symons Clamp & Mfg. Co. of Chicago, Illinois, such panels being shown and described in pending United States patent application Serial No. 854,967, filed on November 23, 1959, now Patent No. 2,997,769, and entitled "Tie Rod Assembly for Concrete Wall Forms." A concrete form panel of the type which is shown and described in the aforementioned patent applications consists essentially of a shallow tray-like structure in the form of a flat rectangular plywood facing, the marginal edges of which are completely encased in a metallic rectangular reinforcing frame including longitudinal and transverse frame members. Such a panel is adapted to be set up in edge-to-edge relationship with similar panels to provide one of two opposed form structures wherein the facings of the panels oppose each other in spaced relationship and wet concrete is adapted to be poured between the two structures. Such panels also find use in connection with the formation of horizontal floor and ceiling slabs and, in such an instance, they are arranged in edge-to-edge relationship with the panel facings lying in a common horizontal plane so that the concrete may be poured on the continuous unbroken upwardly presented slab-supporting surface offered thereby.

"Steel-Ply" panels of this type under consideration are manufactured in sizes which vary both as to length and width, the latter dimension being a factor of particular importance to the present invention. Such panels are manufactured in widths ranging from four inches up to twenty-four inches. Regardless of the size of the panels, the marginal steel frame members remain substantially the same in cross-sectional configuration, each of these frame members being generally of shallow channel shape and presenting marginal ribs and an interconnecting web. The ribs are notched at various distances along their length so that when adjacent panels are positioned in edge-to-edge relationship, adjacent notches move into register and define therebetween rectangular openings for the reception therethrough of tie rods. Additionally, the web portions of the frame members are formed with rectangular slots therein so that fastening devices in the form of T-bolts which are passed through the slots may be employed for anchoring the ends of the tie rods in position,

all in a manner that has been set forth in the aforementioned patent application.

The notched marginal ribs and the slotted webs in the marginal frame members of "Steel-Ply" panels render the outside surfaces of these frame members irregular in contour and thus it is an extremely difficult task to clean such panels by manual operations. There is a tendency for concrete to adhere to the marginal frame members and collect in the various notches and slots so that extraordinary measures must be resorted to in order to dislodge the accumulated or deposited concrete. Frequently, it is necessary in stubborn cases to resort to the use of impact tools such as hammer and chisel. Less difficulty is encountered in cleaning the plywood facings of such panels inasmuch as it has long been customary to treat these facings with a suitable oil that not only preserves the wood structure of the facings, but also conditions the facings for future use in that it affords antifriction or antiadherent coatings for the facings which greatly lessens the tendency for the concrete to adhere to the facings at the time that the panels are pulled from the hardened concrete wall or other structure. Usually any concrete which does adhere to a plywood facing which has been properly lubricated or coated with oil may readily be dislodged by a simple brushing operation.

Heretofore panel-cleaning and lubricating operations have been entirely manual and thus attended by the time-consuming and laborious operations outlined above, hammers, chisels and wire brushes of varying types being required for the cleaning operation, and oil-soaked waste being required for the lubricating or coating operation. Not only are such operations time-consuming but they are of an untidy nature, requiring, as they do, quantities of waste material and containers for oil-rinsing purposes.

The present invention is designed to overcome the above noted limitations that are attendant upon present-day manual methods of cleaning and reconditioning concrete form panels and, toward this end, it contemplates the provision of a substantially fully automatic machine which will receive the panels one at a time at a loading station; then pass the panels successively through a frame-cleaning station where the marginal frame members are effectively divested of any concrete which may have adhered thereto from a previous use.

The provision of a concrete wall form panel-cleaning and reconditioning machine of the character briefly outlined above being among the principal objects of the invention, it is another and important object to provide such a machine wherein the mechanism employed for divesting the marginal steel frame members of the panels from concrete will accommodate the irregularities of contour afforded by the above-mentioned marginal ribs, notches, slots, etc., and dislodge the concrete from these frame members wherever it may occur.

A still further object of the invention is to provide in a panel-cleaning machine of the character under consideration means whereby panels of varying widths may readily be accommodated without requiring extensive machine adjustments.

Another object of the invention is to provide a panel-cleaning machine wherein, after an initial feeding of a panel into the machine at the receiving station, the panel is automatically impelled through the machine at the proper speed for the most effective cleaning operation thereupon by the cleaning instrumentalities of the machine.

Still another object of the invention is to provide a panel-cleaning and reconditioning machine wherein a given run of panels may be effectively operated upon by the machine under the control of a single operator.

The provision of a machine which is relatively simple in its construction and which, therefore, may be manu-

factured at a low cost; one which is rugged and durable and which, therefore, will withstand rough usage; one which is capable of ease of assembly and dismantlement for purposes of inspection, replacement of parts or repair thereof; one which is compact and which, therefore, occupies but little floor space, one which is smooth and silent in its operation; and one which otherwise is well-adapted to perform the services required of it, are further desiderata which have been borne in mind in the production and development of the present invention.

In the accompanying three sheets of drawings forming a part of this specification, one illustrative embodiment of the invention has been shown.

In these drawings:

FIG. 1 is a fragmentary perspective view of a concrete wall form cleaning and reconditioning machine constructed in accordance with the principles of the present invention;

FIG. 2 is an enlarged fragmentary perspective view of a portion of the machine shown in FIG. 1 as viewed from the angle or position represented by the line 2—2 of FIG. 1;

FIG. 3 is a sectional view taken substantially on the vertical plane indicated by the line 3—3 of FIG. 1;

FIG. 4 is an enlarged fragmentary perspective view of a portion of the machine shown in FIG. 1 as viewed from the angle or position represented by the line 4—4 of FIG. 1;

FIG. 5 is a sectional view taken substantially along the line 5—5 of FIG. 3;

FIG. 6 is an enlarged perspective view of a concrete-dislodging scraper assembly employed in connection with the invention;

FIG. 7 is a sectional view taken on the line 7—7 of FIG. 6;

FIG. 8 is an enlarged fragmentary sectional view, somewhat schematic in its representation, illustrating the manner in which the scraper assembly of FIG. 6 operates upon a panel frame member; and

FIG. 9 is a schematic perspective view illustrating the operation of the principal moving component parts of the machine.

The Machine Framework

Referring now to the drawings in detail, and in particular to FIG. 1, the concrete wall form panel-cleaning and reconditioning machine of the present invention has been designated in its entirety by the reference numeral 10 and it involves in its general organization a stationary frame work including a pair of elongated, horizontal, spaced apart longitudinally extending parallel side bars 12 and 14 which are maintained in their spaced relationship by crossbars 16 and which are supported upon legs 18. The side bars 12 and 14 are in the form of lengths of channel stock while the crossbars 16 and legs 18 may be in the form of lengths of angle stock, the various members being suitably welded together.

Spaced inwards from the side bars 12 and 14 are two guide rails 20 and 22, each of which is generally Z-shape in transverse cross section and includes an upwardly extending flange 24, a downwardly extending flange 26, and a horizontal intermediate connecting web 28. The inside face of the upwardly extending flange 24 of the guide rail 20 constitutes a vertical guide surface for one marginal side edge of each concrete wall form panel undergoing treatment in the machine while the other marginal side edges of the panel is guided by the vertical surface which is presented by the web portion 30 of an elongated channel member 32 which has its lower flange 34 supported on and welded to the horizontal connecting web 28 of the guide rail 22. The channel member 32 is substantially coextensive with the guide rail 22 and the upper flange 36 of the channel member 32 is connected to the side bar 14 by a spacer strut 38. The upper edge of the vertical flange 24 of the guide rail 20 is similarly connected to the side bar 12 by a spacer strut 40.

The machine framework further includes four upstanding posts 42, 44, 46 and 48 (see FIGS. 3, 4 and 5) which are secured to the frame side bars 12 and 14 and project upwardly thereabove. The posts 42 and 46 are connected together by an elongated transversely extending inverted channel-shaped rail housing 50 while a similar rail housing 52 extends between the upper ends of the posts 44 and 48. Longitudinally extending straps 54 extend between the posts 42 and 44 and the posts 46 and 48, respectively. The four posts 42, 44, 46 and 48, together with the rail housings 50 and 52 and the straps 54, provide, in effect, a superstructure by means of which a motor-supporting carriage 60 is slidable transversely of the machine in a manner and for a purpose that will be made clear presently.

As best shown in FIGS. 1, 3 and 9, a plurality of transversely extending horizontal roller supports 62 extend between the lower downwardly extending flanges 26 of the guide rails 20 and 22 and have their ends provided with pivot pins or trunnions whereby they are rotatably journaled in the rails. The roller supports 62 are substantially equidistantly spaced from each other insofar as adjacent supports are concerned and the series of supports extends from the front end of the machine to the rear end thereof. The roller supports 62 are adapted to receive thereon successive form panels, such as the panel shown at 64 in FIG. 9, at a receiving station R adjacent to the front end of the machine, and afford an antifriction traction support for the panels so that the latter may be conducted rearwardly through the machine between the guide rails and discharged at the rear end of the machine at a discharge station D.

The "Steel-Ply" Panel 64

In the schematic illustration of FIG. 9, the principal functional machine elements are clearly shown and reference to this view will disclose the manner in which a given panel 64 is operated upon by the machine for panel-cleaning and reconditioning purposes. However, before entering into a description of the operative machine elements, it is deemed pertinent to point out that the panel 64 in this view is a "Steel-Ply" panel of the type which is shown and described in aforementioned pending United States patent application Serial No. 854,967, such a panel being currently manufactured and sold by said Symons Clamp & Mfg. Co. as aforesaid. Reference may be had to such patent application for a full understanding of the construction and use of a "Steel-Ply" panel and it is sufficient for an understanding of the operation of the present panel-cleaning and reconditioning machine to point out that such a panel consists essentially of a plywood facing 70, together with a marginal rectangular steel reinforcing frame including longitudinal frame members 72 and transverse frame members 74. The frame members 72 and 74 are in the form of structural steel bars which are channel-shaped in cross section, and each bar comprises a pair of marginal ribs 76 and a connecting base or web portion 78. On the side of the web portion 78 that is opposite to the ribs 76, is a lateral flange or enlargement 80 which is spaced inwardly a slight distance from the inside edge of the frame member and affords a right angle recess 82 in which the adjacent edge of the plywood facing 70 seats with its outside face flush with said inside edge of the frame member. The ribs 76 are formed with spaced pairs of transversely registering notches 84. Rectangular slots 86 are formed in each web portion 78 and they register with each pair of notches 84 respectively. The notches 84 afford clearance regions for passage of tie rods between adjacent panels when the panels are arranged in edge-to-edge relationship in a concrete wall form installation, and the slots 86 are provided for the purpose of receiving T-bolts to hold the ends of the tie rods in place, all in a manner which has been disclosed in the aforementioned patent application.

The notched ribs 76 and the rectangular slots 86 are sig-

nificant to the present invention only in that they illustrate the irregularity of the surface contour of the longitudinal and transverse frame members 72 and 74 and the problem which such irregularity presents when cleaning operations are effected upon these longitudinal and transverse members.

The Operating Stations

Still referring to FIG. 1 and FIG. 9, in passing from the receiving station R to the discharge station D, the various panels 64 are conducted through a side cleaning station S where the panel sides, i.e., the longitudinal and transverse frame members 72 and 74, may be operated upon by a pair of rotary concrete-dislodging scraper assemblies 90 and 92 on opposite sides of the machine. From the side cleaning station S, the panels are conducted through a sweeping or brushing station B where the panel facings 70 are operated upon by a rotary brush assembly 94. Thereafter, the panels are passed through a lubricating station L where a coating of a suitable oil is applied to the panel facings 70 by way of a lubricating roller 95. From the lubricating station L, the panels are conducted to the discharge station D.

The panels 64 are manually and successively fed to the receiving station R of the machine and, after being manually urged forwardly along the series of roller supports 62, are picked up, so to speak, by a drive belt 96 and a series or group of the roller supports 62. Said series of roller supports is positively driven by the belt 96 with the result that the panels are forcibly conducted through the side cleaning station S. The longitudinal extent of the panels 64 is sufficiently great that control of forward movement of the panels is not relinquished by the belt 96 until such time as the panels have been projected well into the brushing station B. Where a single panel 64 is undergoing treatment, it may be induced to complete its passage through the brushing station B by manual urging thereof, but where successive panels are undergoing treatment, the forward or leading edge region of a succeeding panel will engage the rear or trailing edge region of a preceding panel and cause it to be pushed forwardly through the lubricating station and from thence to the discharge station where it will automatically be ejected from the machine.

The Receiving Station R

The receiving station R is devoid of operating instrumentalities other than the antifriction roller supports 62. This station is at the extreme forward end region of the machine and the various panels 64 may be placed directly upon the roller supports 62 for subsequent forward movement through the machine. It is merely necessary for the operator to position one longitudinal side edge of the panel against the vertical inside face of the web portion 30 of the channel member 32 and then move the panel forwardly along the series of roller supports 62 so that upon release of the panel by the operator, the inherent momentum of the panel will cause the panel to coast to a point where its forward edge will be engaged by the belt 96 and by the roller supports 62 that are driven thereby for subsequent forcible impelling movement through the machine.

A control box 100, including its associated control panel 102, switches 104 and other electrical control instrumentalities, is shown as being mounted on the side bar 12 at the receiving station R where it is accessible to the operator of the machine. The control devices which are associated with the control box 100 form no part of the present invention and it is deemed sufficient to state that the four electric switches which appear on the top wall of the control box 100 and are collectively designated by the reference numeral 104 serve to control the energization and deenergization of the four electric motors which are associated with the machine and the functions of which will be described subsequently.

The Side Cleaning Station S

Referring now to FIGS. 1, 3, 4 and 5, the previously-described superstructure which is formed by the four vertical upstanding posts 42, 44, 46 and 48 is disposed at the side cleaning station S and is for the purpose of tractionally supporting the previously-mentioned carriage 60. Such carriage consists of a horizontal plate 110 (FIGS. 4 and 5) and a vertical plate 112. The plate 110 is provided with upstanding marginal side flanges 114 which carry suspension links 115 having traction rollers 116 mounted on their upper ends. The traction rollers 116 are adapted to travel on rails 118 in associated relation with the rail housings 50 and 52 at the top of the superstructure. The vertical plate 112 is provided with a lateral trapezoidal flange 120 to which there is attached a handle 122 by means of which the carriage 60 as a whole may be shifted transversely of the machine in either direction.

The vertical plate 112 of the carriage 60 has secured thereto a motor support or mount 124 for an electric motor M_1 which is arranged so that its axis extends vertically and its armature shaft 126 depends from the motor housing 128 thereof. The vertical plate 112 has mounted thereon adjacent to the lower end thereof a supporting bracket 130 which carries a pair of vertically spaced bearing supports 132 for a vertical shaft 134. The latter is associated with, and serves as a supporting and driving medium for, the scraper assembly 90. The shaft 134 is in axial alignment with the motor shaft 126 and is operatively connected thereto by a coupling assembly 136.

As shown in FIGS. 1 and 9, two guide rails 140 and 142 are mounted on the supporting bracket 130 and are movable bodily therewith. The guide rail 140 leads the rotatable scraper assembly 90 with respect to the direction of travel of the panels 64 through the machine, while the guide rail 142 trails the scraper assembly. The guide rails 140 and 142 are provided for the purpose of guiding the forward end of the panel 64 into proper register with the scraper assembly 90 so that the adjacent longitudinal edge of the panel will assume a substantially tangential position with respect to the scraper instrumentalities as will be described in detail hereafter.

The scraper assembly 92 is rotatable about a fixed vertical axis at the right-hand side of the machine as viewed in FIG. 1. The two scraper assemblies 90 and 92 are identical in construction so that a description of one will suffice for the other. The scraper assembly 92 has its central shaft 134 drivably connected by a coupling 144 to the motor shaft 146 of an electric motor M_2 . The motor M_2 is supported adjacent to the lower end of a downward extension 146 (FIG. 1) of the vertical post 46.

The Scraper Assemblies 90 and 92

As previously stated, the scraper assemblies 90 and 92 are identical so that a description of the assembly 90 which is shown in detail in FIG. 6 will suffice for the assembly 92. The assembly 90 includes the previously-mentioned central rotary shaft 134, this shaft having fixedly mounted thereon for rotation therewith spaced circular carrier disks 150 and 152. An annular series of vertical rods 154 extends between the disks 150 and 152 and are arranged in circumferentially spaced relationship. Each rod has loosely mounted thereon a series of individually rotatable scraper elements 156 which are in the form of toothed disks of generally star-shaped configuration and the peripheral teeth 158 of which are of relatively sharp configuration. As shown in FIG. 7, each scraper element 156 is provided with a central hole 160 through which its associated rod 154 loosely extends. The diameter of the hole 160 is somewhat greater than the diameter of the rod 154 so that the scraper element may float loosely on the rod and, under the influence of centrifugal force during rotation of the assembly 90, assume an eccentric position relatively to the axis of the rod. The various

scraper elements 156, being independently movable, may thus follow the irregular or notched contour of the panel side or longitudinal frame members 72 during passage of the panels 64 through the side cleaning station S.

The Panel Guiding and Impelling Instrumentalities

As best shown in FIGS. 1, 4 and 9, the carriage 60 is normally and yieldingly biased inwardly of the machine framework by means of a counterweight 170 which is attached to the free end of a cable 172. The latter passes over a pulley 174 and has its other end attached to a lug 176 (see FIG. 4) on a block 178 which, in turn, is mounted on the horizontal plate 110 of the carriage 60. A second block 180 is formed with a socket 182 for reception therein of a pin 184. The socket 182 is designed for selective vertical register with a series of elongated slots 186 in a fixed transversely extending bar 188 which extends between the two straps 54 of the superstructure. The pin 184 is adapted to be selectively passed through the various slots 186 and received in the socket 182 to lock the carriage in approximate positions transversely of the framework so that the distance between the two scraper assemblies 90 and 92 will roughly approximate the width of a given group of identical panels 64 which are successively to be fed to the machine.

The weight of the counterweight 170 is such that it will pull the carriage 60 bodily inwardly of the framework and cause the scraper assembly 90 to approach the scraper assembly 92 to the end that the two assemblies will confine a panel 64 therebetween with each assembly exerting the necessary pressure upon the longitudinal frame members 72 to properly clean the same.

Inasmuch as the various scraper elements 156 are loosely and floatingly mounted on their respective rods 154, and inasmuch as they are individually shiftable in a radial direction relatively to the central axis of the assemblies 90 and 92 with which they are associated, these scraper elements will follow the irregular contour of the longitudinal frame members 72 at the respective elevations at which they operate. For example, in FIG. 8, the scraper assembly 90 is shown in operative relationship with respect to a longitudinal frame member 72 during a concrete dislodging operation. It is to be noted that the uppermost scraper elements 152 on the adjacent rod 154 operate upon the uppermost marginal rib 76 of the frame member 72 while the lowermost scraper elements operate upon the lower marginal rib. Certain intermediate scraper elements will be projected into the rectangular slot 86 to dislodge concrete therefrom. Still other scraper elements will operate upon the web portion 78 of the frame member. The action of the various scraper elements 152 is an impact one due to the fact that these elements are floatingly or loosely mounted on the rods 154 and are "slammed" against the outer surface of the longitudinal frame member 72 as the scraper assembly 90 as a whole is rotated under the driving influence of the motor M₁.

As each panel 64 approaches the side cleaning station S, the adjacent leading corner of the panel moves against the guide rail 140 with the result that the panel is forced against the web portion 30 of the channel member 32 and confined between such channel member and the guide rail 140. A hold-down wheel 190 is rotatably mounted on a horizontal shaft 192. The latter is suitably journaled in bearings 194 (see FIG. 3) which are mounted on the machine framework. The hold-down wheel 190 engages the upper face of the panel facing 70 and stabilizes the panel as the same slides or moves therebeneath on the roller supports 62.

The drive belt 96 (see FIGS. 3 and 7) has a horizontal reach section which passes over four of the roller supports 62 and the belt also passes beneath a drive pulley 195 which is mounted on the output shaft 196 of a gear reduction device 198 the input shaft of which is operatively connected through a suitable coupling (not shown)

to the drive shaft (also not shown) of an electric motor M₃. The motor M₃ and gear reduction device 198 are mounted on a supporting bracket 206 which is suitably carried by the machine framework.

The Brushing Station B

Referring now to FIGS. 1, 2 and 7, the rotary brush assembly 94 includes a rotary brush proper 210 which is mounted on a brush shaft 212, the ends of which are rotatably journaled adjacent to the distal ends of a pair of tiltable arms 214 (see FIG. 2). The inner or proximate end of each arm 214 is pivoted as at 216 to a bracket 218 which is mounted on the machine framework. Each arm 214 carries a block 220 through which there loosely extends a threaded rod 222. The lower end of such rod is pivoted as at 224 to the bracket 218 and two nuts 226 and 228, above and below the block respectively, are threadedly received on the rod 222 so that the elevation of the block, as well as the associate arm 214, may be adjusted to raise or lower the brush, as the case may be, and effect the desired degree of pressure of the brush on the panel facing 70 as a panel 64 passes beneath the brush.

One end of the brush shaft 212 carries a pulley 230 which is adapted to be driven from a pulley 232 on the motor shaft 234 of an electric motor M₄. A belt 236 passes over both pulleys and connects the same in driving and driven relationship. The motor M₄ is mounted on a floating motor support 240 which is pivoted as at 242 to the machine framework so that it may swing downwardly and compensate for any lost motion arising due to lowering of the brush shaft 212.

The Lubricating Station L

As the panels 64 emerge from the brushing station B and enter the lubricating station L, they are adapted to pass beneath the lubricating roller 95. The roller 95 is a floating roller by reason of the fact that it is carried at the outer ends of a pair of arms 244 the inner ends of which are pivoted as at 246 in blocks 248 on the machine framework. The lowermost position of the lubricating roller 95 is determined by means of pins 249 which are carried by the arms 244 and are engageable with the longitudinal frame members 20 and 32, respectively. The roller 95 includes a roller body 250 and a covering 252 of an absorbent material such as felt or the like. A supply of a suitable lubricating and conditioning oil is adapted to be fed to the roller 95 from an overlying horizontal tubular drip pipe 254 having a series of perforations 256 in the lower side thereof. From such perforations, oil is adapted to drip onto the absorbent covering 252 of the underlying roller 95. Oil is fed to one end of the pipe 254 through a conduit 258 leading from an oil reservoir 260. The latter is supported on standards 262 which are mounted on the side bar 12. A shut-off valve 264 is interposed in the conduit 258.

In its lowermost position, the lubricating roller 95 is spaced above the general plane of the series of roller supports 62 a distance slightly less than the vertical thickness of the panels 64 passing through the machine so that when any given panel encounters the roller 95, the latter will ride up on the panel and traverse the upper face of the panel facing 70 as the panel passes through the lubricating station L. The roller 95 deposits a film or thin coating of oil on the adjacent or inner surfaces of the panel facings 70 to the end that the facings are maintained in proper condition and do not permit concrete to stick to them in connection with use of the panels.

The Discharge Station D

The discharge station D is devoid of operating instrumentalities other than the roller supports 62 which lie within the zone defined by this station. As previously described, the panels 64 arriving at the discharge station D move under the impetus of succeeding panels in the series of panels undergoing treatment. The panels 64 leaving the lubricating station L move onto the rollers 62 at the

discharge station D and remain there until such time as a succeeding panel issuing from the lubricating station engages the panel and forces the same from the machine.

Operation of the Machine

In view of the previous description of the handling and treatment of successive panels 64 which are fed to the machine at the receiving station R and pass successively through the side cleaning station S, the brushing station B, and the lubricating station L, a detailed description of the operation of the machine is not necessary. It is deemed sufficient to state that the machine is operable under the control of a single operator, who, at the commencement of any given run of panels through the machine, will select the proper slot 186 (see FIG. 4) for placement of the pin 184 so as to locate the carriage 60 at an approximate transverse position relatively to the machine framework where the distance between the two scraper assemblies is slightly less than the minimum overall width of the particular size of panels involved in the run. It will be understood, of course, that for economy of operation, a given run of panels will include a group of panels of the same width.

After the pin 184 has been passed through the proper slot 186 and into the socket 182 in the block 180, the carriage 60 will be free to move transversely of the machine framework throughout a limited range as determined by the length of the slot. This range of movement is sufficient to permit the guide rail 140, which moves bodily with the carriage, to exert a camming action on the adjacent panel frame member 72 and shift the carriage to a position wherein the two scraper assemblies 90 and 92 engage the sides of the panel therebetween, while at the same time, the pin 184 has freedom of movement in the selected slot 186.

Due to the looseness of the various scraper elements or disks 156 (see FIGS. 6 and 7) on their respective vertical rods 154, what may be described as a hammering or impacting operation will take place each time one of the elements makes a complete revolution about the axis of the rod 154 on which it is mounted. As previously described, the individual scraper elements will follow the contour of the adjacent panel side and effectively remove concrete therefrom by a combined impacting and scraping operation.

The brushing action which takes place at the brushing station B requires but little description. The brush assembly is adjustable for bristle wear by manipulation of the adjusting nuts 226 and 228 on the threaded rod 222. The direction of rotation of the brush is preferably, but not necessarily, in such a direction that the loosened concrete or other material issuing from the panel facing 70 will be flung rearwardly of the machine toward the discharge station so that this loosened material will not collect on oncoming panels and require more than one encounter with the brush assembly.

The lubricating action which takes place at the lubricating station under the influence of the absorbent oil-soaked roller covering 252 serves to seal any pores in the panel facing 70, as well as to otherwise preserve this facing. The application of oil to the panel facing also serves to facilitate loosening the panel from the concrete bond which exists during actual use of the panel after the concrete of a given installation has become hardened or set. Various oils which are suitable for this purpose are available on the present market, one such oil which has given excellent service being known as "Kleen-Crete," the trademark name of the Union Petroleum Refining Company of Council Bluffs, Iowa.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit of the invention. Therefore, only in-

sofar as the invention has particularly been pointed out in the accompanying claims is the same to be limited.

Having thus described the invention what I claim, as new and desire to secure by Letters Patent is:

1. In a machine for reconditioning concrete wall form panels having rectangular panel facings and parallel side frame members, a machine framework establishing a side cleaning zone, a plurality of horizontally disposed roller supports for conducting the panels successively through said zone horizontally and endwise with the operative faces of the panel facings presented upwardly, a first rotary scraper device mounted for rotation about a fixed vertical axis and positioned to engage one of the frame members of a panel passing through said zone, a carriage 10 mounted for transverse shifting movement toward and away from the first rotary scraper device and transversely of the path of travel of the panels, a second scraper device mounted on said carriage for movement bodily therewith and for independent rotation about a vertical axis, and constant tension means yieldingly biasing said carriage in the direction of said first scraper device, said panel being adapted upon entering said zone to pass between said scraper devices so that the second scraper device engages the other frame member and forces the panel bodily 15 into operative engagement with said first scraper device.

2. A machine for reconditioning concrete wall form panels as set forth in claim 1 and including, additionally, a hold-down roller mounted for rotation about a horizontal axis above the level of said roller supports and adapted tractionally to engage the upper face of said panel facing during passage of the panel through said zone.

3. A machine for reconditioning concrete wall form panels as set forth in claim 1 and wherein said constant tension biasing means comprises a cable having one end attached to the carriage, a pulley mounted on the framework and over which the cable passes, and a weight on the free end of the cable.

4. A machine for reconditioning concrete wall form panels as set forth in claim 1 and including, additionally, motor-driven means for forcibly impelling the panels forwardly on said roller supports through said zone.

5. In a machine for reconditioning concrete wall form panels having rectangular panel facings and parallel side frame members, a machine framework establishing a side cleaning zone, a plurality of horizontally disposed roller supports for conducting the panels successively through said station horizontally and endwise with the operative faces of the panel facings presented upwardly, a first rotary scraper device mounted for rotation about a fixed vertical axis and positioned to engage one of the frame members of a panel passing through said zone, a carriage 45 mounted for transverse shifting movement toward and away from the first rotary scraper device and transversely of the path of travel of the panels, a second scraper device mounted on the carriage for movement bodily therewith and for independent rotation about a vertical axis, means yieldingly biasing said carriage in the direction of said first scraper device whereby the panel, upon entering between the scraper devices, will have the other frame member thereof engaged by the second scraper device so that the panel will be forced bodily into operative engagement with the first scraper device, and a series of limit stops on said framework designed for selective engagement with an element on the carriage for limiting the extent to which said carriage may move in the direction of said first scraper device.

6. A machine for reconditioning concrete wall form panels as set forth in claim 5 and including, additionally, a guide rail mounted on the carriage and positioned in the path of movement of the panel and designed for engagement with the panel as the latter approaches said zone for causing deflection of the carriage to a position 75 wherein the second scraper device carried thereby is moved

to a position of approximate longitudinal register with said other side frame member.

7. In a machine for reconditioning concrete wall form panels having rectangular panel facings and parallel side frame members, a machine framework establishing a side cleaning zone, a plurality of horizontally disposed roller supports for conducting the panels successively through said station horizontally and endwise with the operative faces of the panel facings presented upwardly, a first rotary scraper device mounted for rotation about a fixed vertical axis and positioned to engage one of the frame members of a panel passing through said zone, a carriage mounted for transverse shifting movement toward and away from the first rotary scraper device and transversely of the path of travel of the panels, a second scraper device mounted on the carriage for movement bodily therewith and for independent rotation about a vertical axis, means yieldingly biasing said carriage in the direction of said first scraper device whereby the panel, upon entering between the scraper devices, will have the other frame member

thereof engaged by the second scraper device so that the panel will be forced bodily into operative engagement with the first scraper device, said framework including a transversely extending frame bar having a series of spaced elongated aligned slots therein, and a limit stop pin selectively receivable through said slots and designed for engagement with a shoulder on the carriage for limiting the extent to which the latter may be moved toward said first scraper device.

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