

June 2, 1931.

M. VARGO

1,807,765

CLEANING, SANDING, AND POLISHING MACHINE

Filed Sept. 27, 1929

8 Sheets-Sheet 1

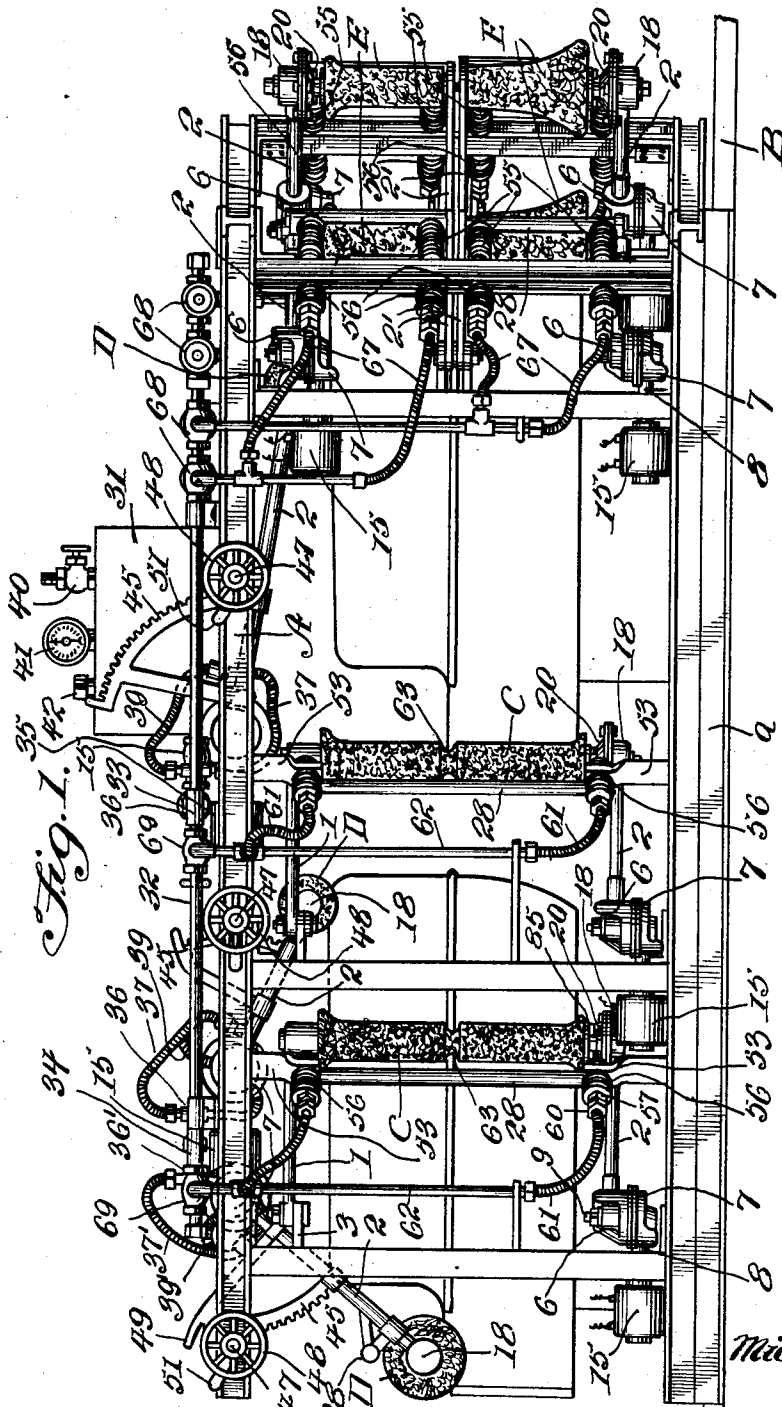


Fig. 1.

J. T. L. Wright
WITNESS:

Michael Vargo
INVENTOR
BY Victor J. Evans
ATTORNEY

June 2, 1931.

M. VARGO

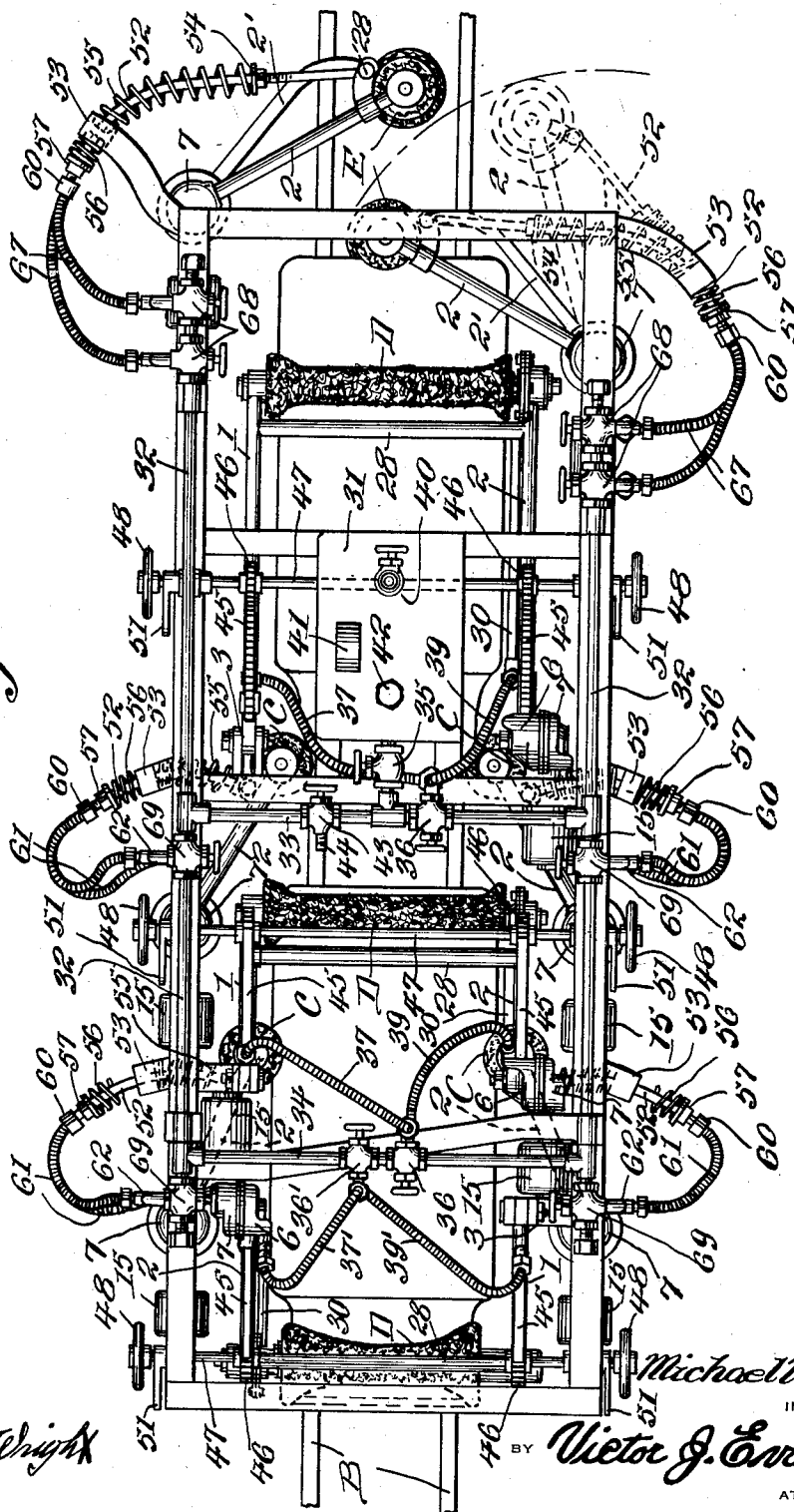
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8 Sheets-Sheet 2

Fig. 2.



J. T. L. Wright
WITNESS:

Michael Vargo
INVENTOR
BY Victor J. Evans
ATTORNEY

June 2, 1931.

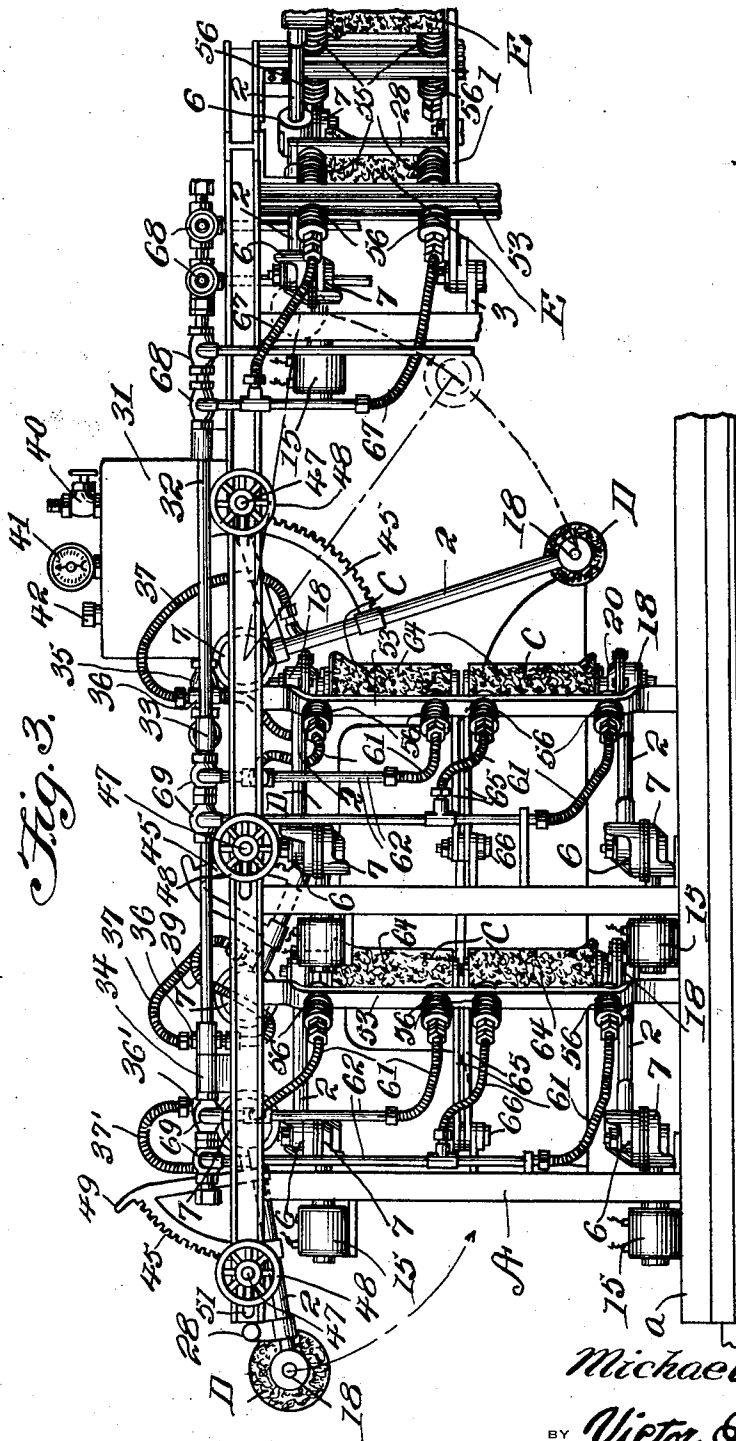
M. VARGO

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CLEANING, SANDING, AND POLISHING MACHINE

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8 Sheets-Sheet 3



WITNESS:

J. L. Wright

Michael Vargo
INVENTOR

BY *Victor J. Evans*

ATTORNEY

June 2, 1931.

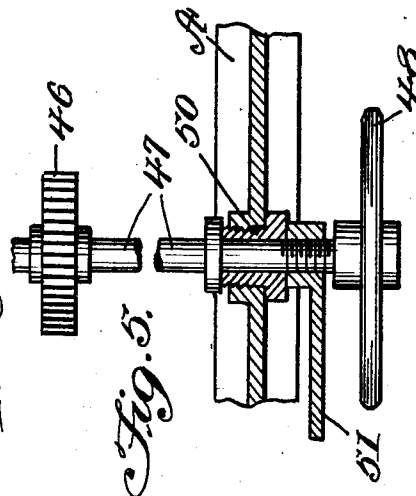
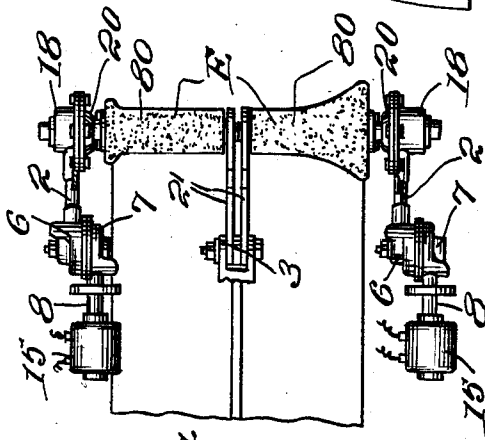
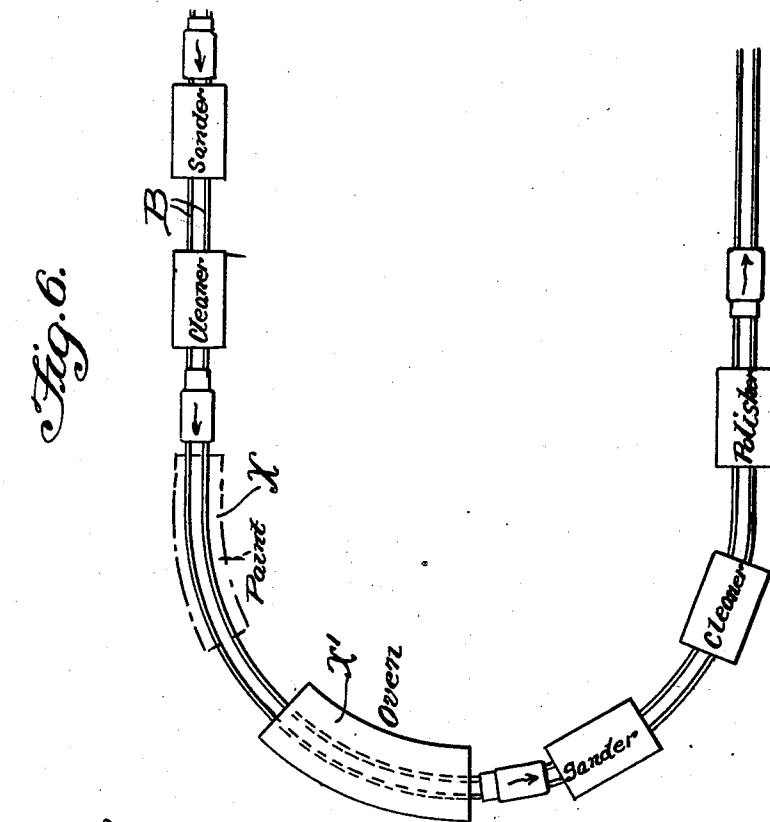
M. VARGO

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CLEANING, SANDING, AND POLISHING MACHINE

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8 Sheets-Sheet 4



Michael Vargo
INVENTOR

BY Victor J. Evans
ATTORNEY

WITNESS: J. L. Wright

June 2, 1931.

M. VARGO

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CLEANING, SANDING, AND POLISHING MACHINE

Filed Sept. 27, 1929

8 Sheets-Sheet 5

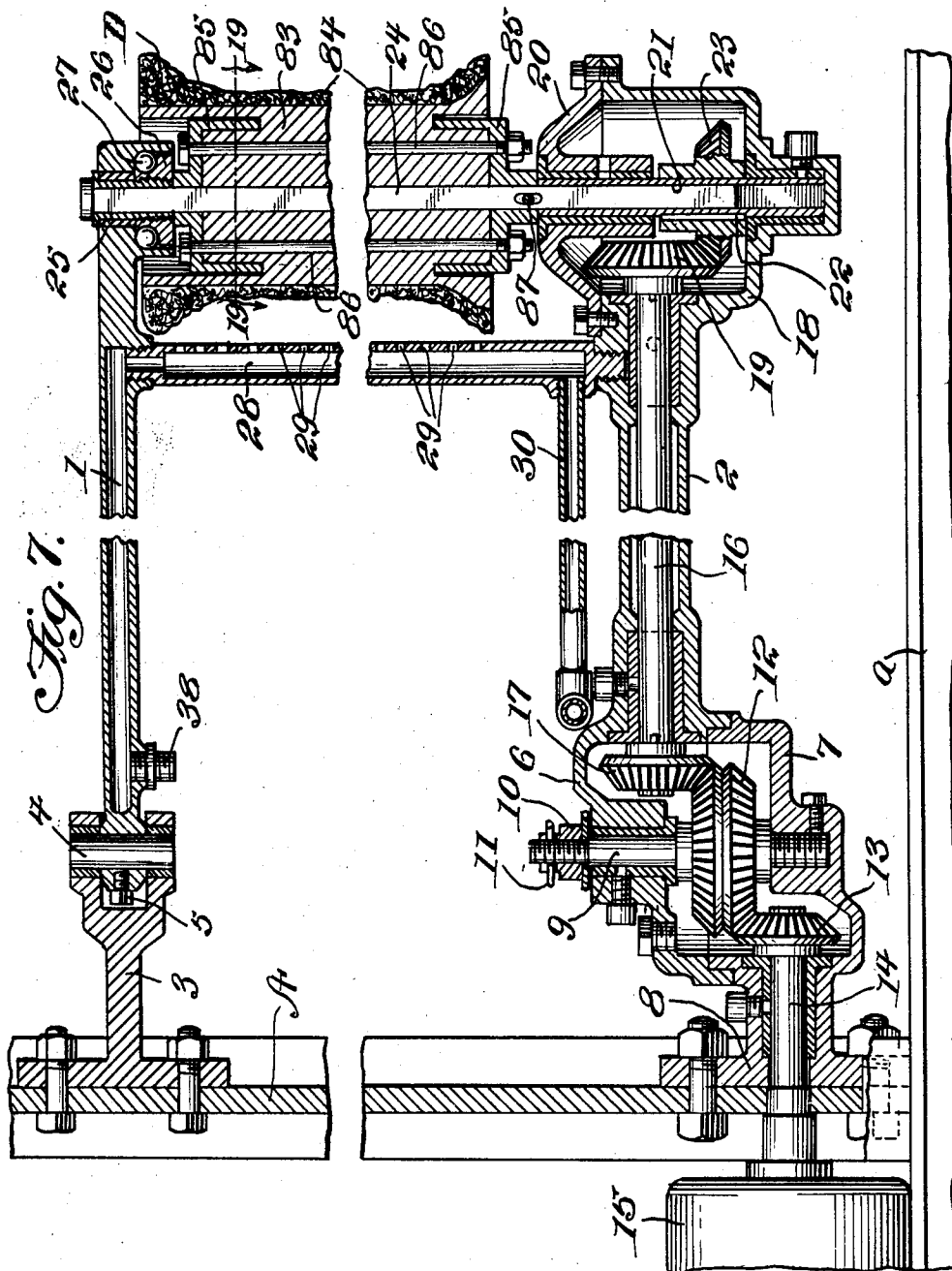


Fig. 7.

Michael Vargo

INVENTOR

BY

Victor J. Evans

ATTORNEY

WITNESS:

J. L. Wright

June 2, 1931.

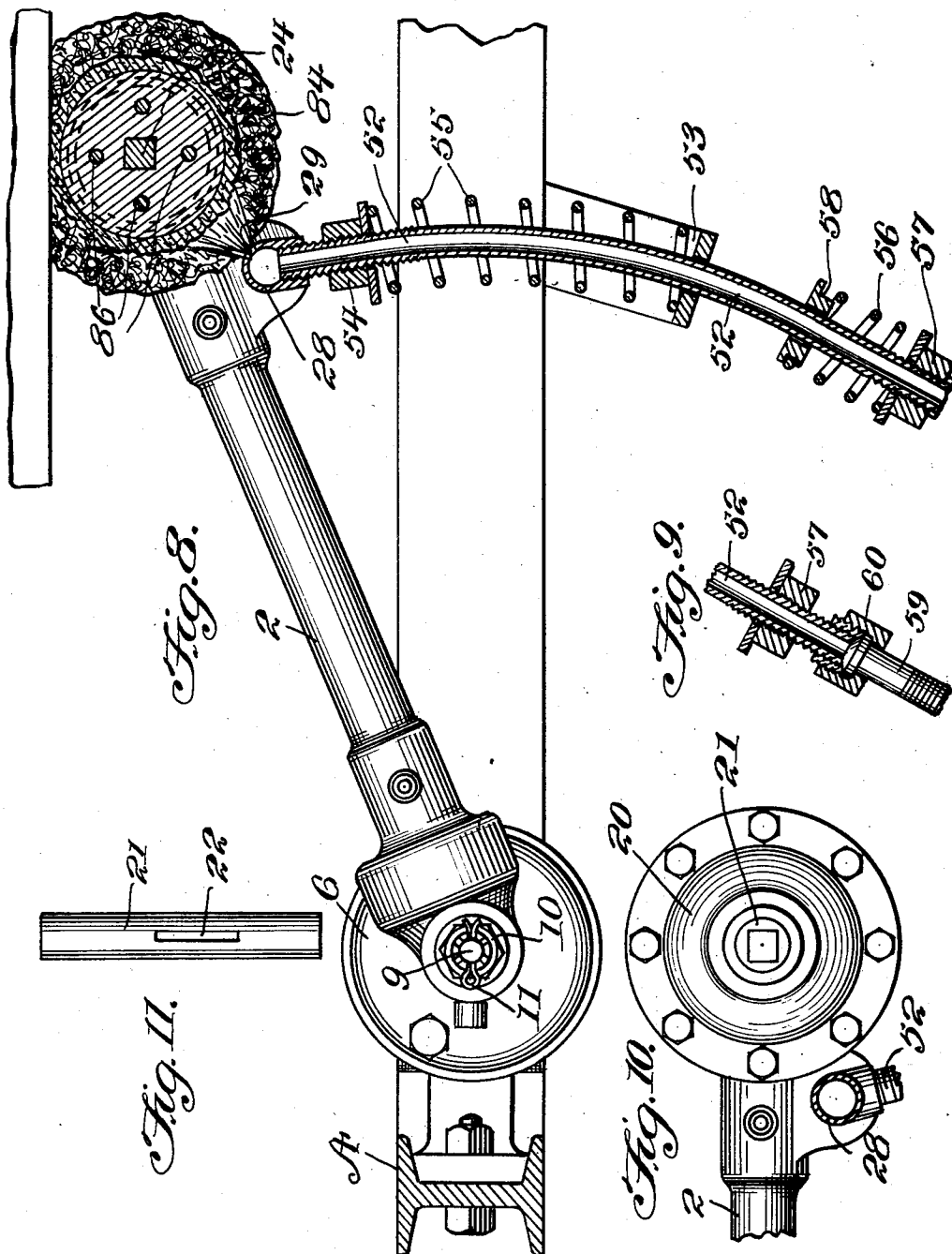
M. VARGO

1,807,765

CLEANING, SANDING, AND POLISHING MACHINE

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8 Sheets-Sheet 6



WITNESS: *G. T. Wright*

Michael Vargo

INVENTOR

BY *Victor J. Evans*

ATTORNEY

June 2, 1931.

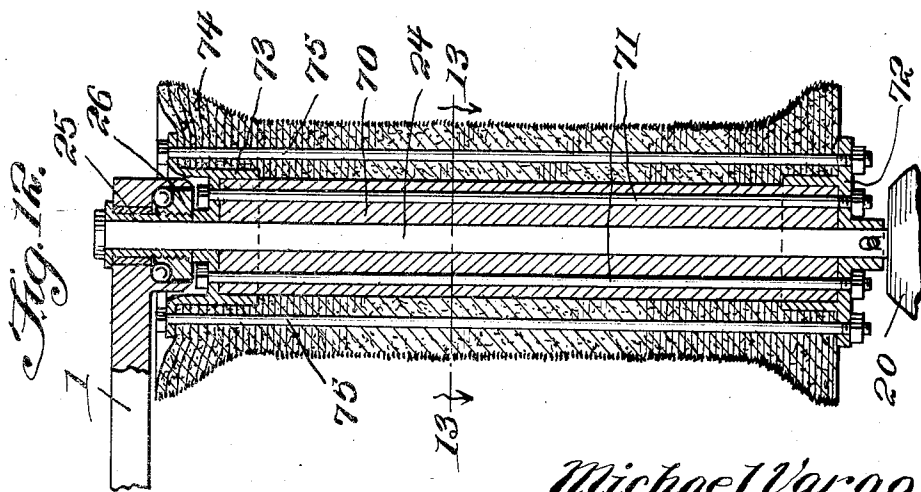
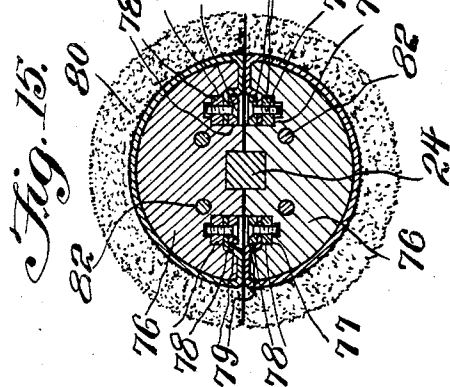
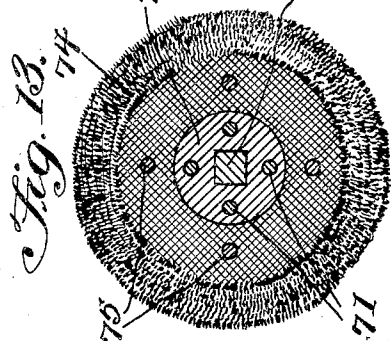
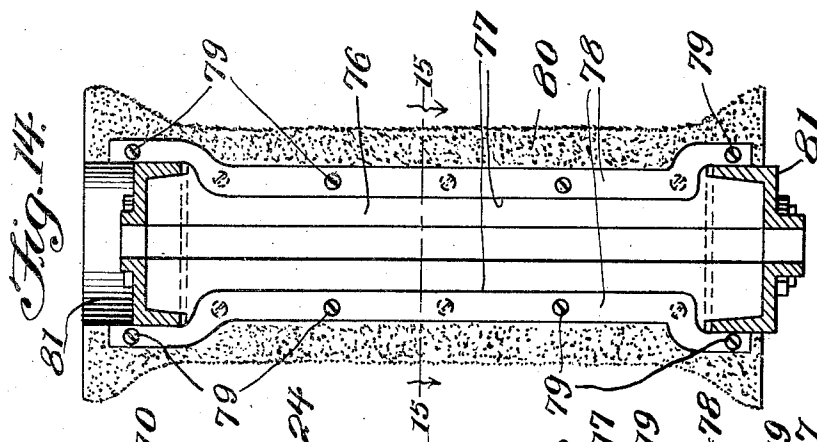
M. VARGO

1,807,765

CLEANING, SANDING, AND POLISHING MACHINE

Filed Sept. 27, 1929

8 Sheets-Sheet 7



WITNESS: *J. L. Wright*

Michael Vargo
INVENTOR

BY *Victor J. Evans*
ATTORNEY

June 2, 1931.

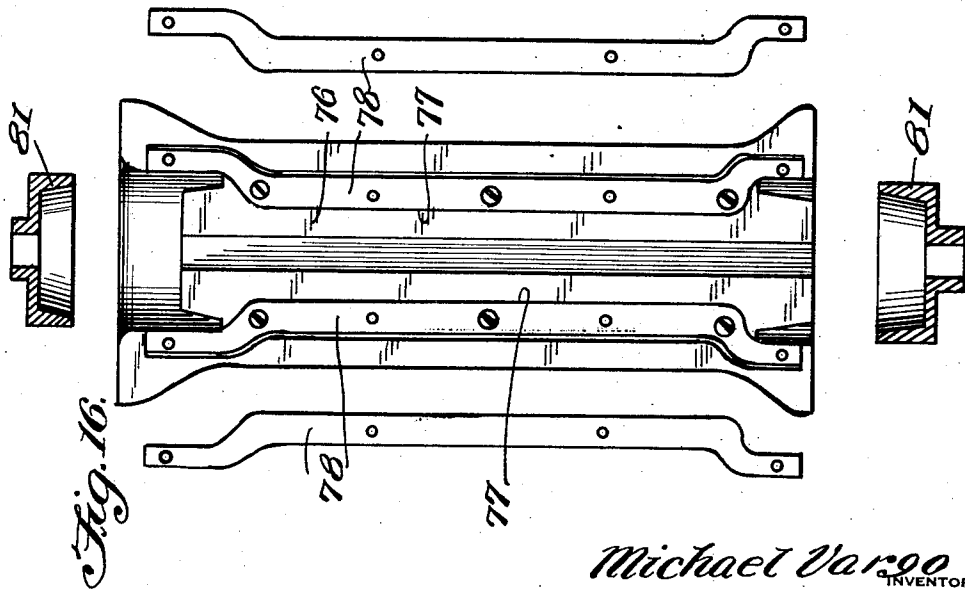
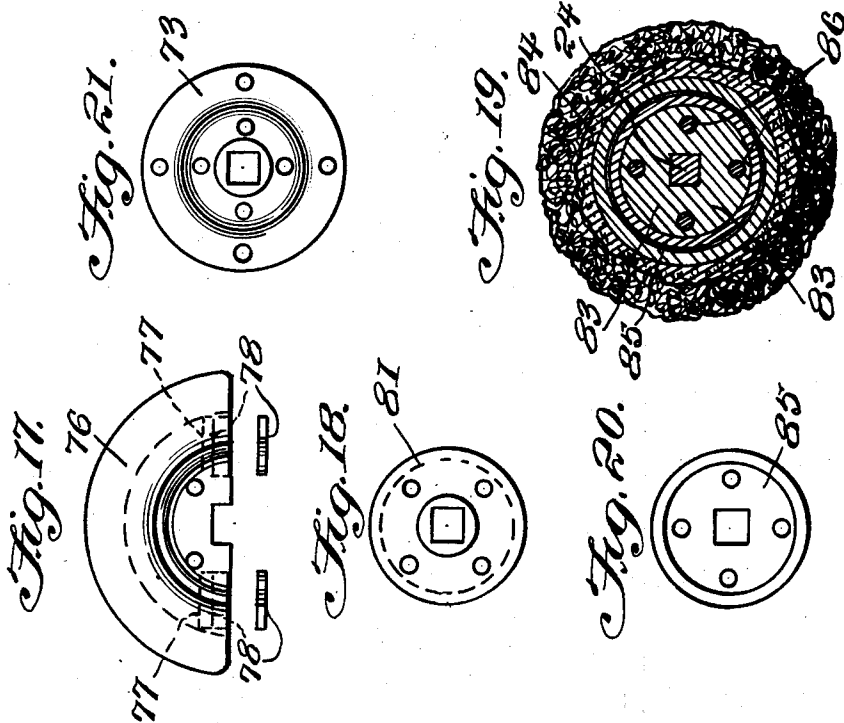
M. VARGO

1,807,765

CLEANING, SANDING, AND POLISHING MACHINE

Filed Sept. 27, 1929

8 Sheets-Sheet 8



WITNESS: *J. L. Wright*

Michael Vargo
INVENTOR
BY *Victor J. Evans*
ATTORNEY

UNITED STATES PATENT OFFICE

MICHAEL VARGO, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-SEVENTH TO FRED CHESTENICK, ONE-SEVENTH TO ERNEST W. HODGE, ONE-SEVENTH TO WILFRED A. POIRIER, ONE-SEVENTH TO CHARLES H. DILDINE, ONE-SEVENTH TO HERMAN L. SCHROCK, AND ONE-SEVENTH TO ALEX GALANT, ALL OF DETROIT, MICHIGAN

CLEANING, SANDING AND POLISHING MACHINE

Application filed September 27, 1929. Serial No. 395,684.

This invention relates to means for cleaning, sanding and polishing automobile bodies and the like, the general object of the invention being to provide a frame through which the body is designed to pass and which supports side and top brushes for engaging the sides and top of a body as it passes through the frame, with means for yieldingly holding the brushes against the body.

Another object of the invention is to make the brushes interchangeable so that the device can be used for applying polish to the body or for sanding or polishing the same, with means for supplying polish to the polishing brushes when the device is used for this purpose.

A further object of the invention is to provide means whereby some of the brushes can be caused to engage the hood and cowl parts of bodies and the deck parts of coupé types of bodies.

A still further object of the invention is to provide means whereby air can be supplied to the brushes to clean the same.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claim.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is a side view of the apparatus, showing two bodies passing through the same.

Figure 2 is a top plan view thereof.

Figure 3 is a side view, showing the apparatus operating on a coupé type of body.

Figure 4 is a view showing a two-part brush acting on the rear of a body.

Figure 5 is a sectional detail view showing means for raising and lowering upper brushes of the apparatus and also for locking such means against movement.

Figure 6 is a diagrammatic view showing how a number of these devices may be used

with a paint applying apparatus and an oven, so that the entire operation of sanding, cleaning, painting, baking and again sanding, cleaning and then polishing the bodies can be carried out in a continuous manner.

Figure 7 is a sectional detail view showing the supporting means for one of the top brushes and the means for rotating the same, together with means for applying air or polish to the brush.

Figure 8 is a sectional view, with parts in plan, of one of the side brushes.

Figure 9 is a sectional view showing the connection between two sections of part of the conduit.

Figure 10 is a fragmentary plan view showing the housing for the lower end of one of the brush shafts.

Figure 11 is a view of the sleeve in said housing which receives the gear and the lower end of the brush shaft.

Figure 12 is a sectional view through the laminated brush.

Figure 13 is a section on line 13—13 of Figure 12.

Figure 14 is a sectional view through the sander brush.

Figure 15 is a section on line 15—15 of Figure 14.

Figure 16 is a view of one section of the sander brush, with the parts separated.

Figure 17 is a top plan view of one of the sections of the sander brush.

Figure 18 is a top plan view of one of the caps for the sander brush.

Figure 19 is a section on line 19—19 of Figure 7.

Figure 20 is a top plan view of one of the caps of the polishing brush.

Figure 21 is a top plan view of one of the caps for the laminated brush.

As shown in these drawings, the frame A of the apparatus is of skeleton formation and comprises the two sides and the top, the lower edges of the sides being suitably supported on the base *a* and the frame has its ends open so that a vehicle body can pass through the same, the body being placed on a truck operating on a track B, or the bodies

can be placed on a conveyor of any desired form. A plurality of brushes C is arranged at the sides of the frame for contacting the sides of the bodies and a plurality of brushes D are supported from the top of the frame for contacting the top portions of the bodies, and brushes E are supported from the frame for engaging the rear of the bodies. All the brush assemblies are practically the same and one of the top brushes, shown in Figure 7, will be described in detail as follows:

The brush is carried by the arms 1 and 2 of tubular construction, the arm 1 being pivotally connected to a bracket 3 attached to the frame by a stub shaft 4 which passes through the forked end of the bracket and through the end of the arm with part of the arm being attached to the shaft by a set screw 5. The arm 2 has a section 6 of a housing formed on its end which is rotatably supported on the section 7 of the housing which is formed on a bracket 8 attached to a part of the frame. A horizontally arranged shaft 9 has one end fastened to the section 7 and said shaft passes through a bushing in the section 6, so that this part of the shaft acts as a pivot for the section 6, the section being held against movement on the shaft by means of the nut 10 and the cotter pin 11 engaging the outer end of the shaft. Of course, the shaft 9 is in alignment with the shaft 4, so that the arms will swing in the same arc. A double bevel gear 12 is rotatably arranged on the shaft 9 within the housing and a part of this gear meshes with a beveled gear 13 on the shaft 14 of a motor 15 supported on the frame, the shaft passing through a tubular part of the bracket 8 into the housing. A shaft 16 is journaled in the arm 2 and has a bevel gear 17 on one of its ends which meshes with the other part of the gear 12 within the housing. A housing 18 is formed on the opposite end of the arm 2 and the shaft 16 extends within this housing and has a gear 19 thereon which is located within the housing 18. The housing 18 is provided with a detachable cover 20. A horizontally arranged sleeve 21, having a key 22 thereon, a rotatably supported within the housing 18 and a bevel gear 23 is carried by the sleeve and is fastened thereto by the key. This bevel gear 23 meshes with the bevel gear 19. The sleeve 21 has a square bore to receive the one end of a square shaft 24 which passes through a square bore of the brush and through a square bore in a bushing 25 in the outer end of the arm 1. The bushing is rotatably mounted in the arm and has attached thereto a race 26 for the ball bearings 27. Thus the shaft 24 can be removed so that the brush can be removed and another brush substituted therefor and as will be seen, the motor will drive the brush through the gearing and shafting shown, while not interfering with the swinging movement of the arms 1 and 2.

A perforated pipe 28 has its ends connected with the arms 1 and 2, with its perforations 29 arranged opposite the brush. One end of the pipe 28 for each top brush is in communication with the interior of the arm 1 and a pipe 30 is in communication with the other end of the pipe 28, this pipe extending parallel with the arm 2.

A tank 31 is supported on the top of the frame and a longitudinally extending pipe 32 is supported on the top of each side of the frame, the two pipes being connected together by the pipes 33 and 34. The pipe 33 is connected to the lower part of the tank by a valve connection 35, so that by opening this valve, the fluid in the tank can pass therefrom into the pipe 33 and thus pass through the pipes 32 and the pipe 34. A valve 36 is arranged in each of the pipes 33 and 34 and hose 37 connects each valve with the interior of the arm 1 of each top brush through means of the nipple 38 and a hose 39 connects each valve 36 with the pipe 30 of each top brush. The pipe 34 also carries a valve 36' which is connected by the hose 37' and 39' with the arm 1 and the pipe 30 of a short top brush. The upper part of the tank is provided with a valve 40 which is adapted to be connected to a supply of compressed air so that the liquid in the tank 31 can be placed under pressure and this tank is also provided with a pressure gauge 41 and with a filling device 42. The pipe 33 contains a valve 43 having a nipple 44 thereon so that it can be connected with a source of compressed air, whereby by closing the valve 35 and opening the valve 43, after said valve has been connected with a source of compressed air, air can be supplied to the brushes through the pipes 28 instead of the liquid, this air acting to clean the brushes. The liquid in the tank 31 may be a polishing fluid or a cleaning fluid. Toothed segments 45 are connected with the arms of each top brush and the teeth of these segments mesh with the teeth of gears 46 on a shaft 47 extending across the top of the frame and having a hand wheel 48 at each end thereof so that by turning each shaft, a top brush can be swung into and out of engagement with the top part of a body. One of these top brushes is designed to engage the hood or cowl part of a body and another of these top brushes is designed to engage the rear deck or curved part of a coupé type of body. Another top brush will engage the top part of the body.

Each segment is formed with a handle 49 and each end of each shaft 47 passes through a bushing 50 threaded in a part of the frame and a handle 51 is threaded on each end of each shaft 47 and when said handle is turned to jab against the bushing, the shaft 47 will be held against rotary movement. Thus by loosening the handles 51 and turning the shafts by their hand wheels 48, the brush can

be properly adjusted to engage the upper portions of a body and then by turning the handles 51, the shafts will be held with the brushes in adjusted position.

Each side brush has a curved pipe 52 connected with each end of its perforated pipe 28, this pipe passing through a hole in a bracket 53 and has a nut and washer thereon, shown generally at 54, and a spring 55 encircles the pipe and bears against the washer and a part of the bracket so that these springs tend to hold the side brush against the side of the body. A second spring 56 encircles the pipe 52, with its ends bearing against a nut and washer 57 attached to the outer end of each pipe 52 and against a washer 58 slidably arranged on the pipe 52. This arrangement acts as a bumper, for when the brush swings inwardly, due to the absence of a body in the frame, the washers 58 will strike the brackets 53 and thus stop the inward movement of the brush assembly under the action of the springs 55, and the springs 56 will act as shock absorbers. A nipple 59 is connected with each pipe 52 by a coupling 60 and a hose 61 connects each nipple of each brush assembly with a depending pipe 62, the upper end of which is connected with a pipe 32. Thus the side brushes are supplied with the liquid in the tank 31 or with air passing through the valve 43.

As shown in Figure 1, the side brushes are of such length that they contact the entire side of the body and where the body is provided with a bead, the brushes may be formed with the annular grooves 63 to receive the beads. However, these side brushes may be each formed of two sections 64, as shown in Figure 3, with the perforated pipe of each section connected with a pipe 62 by a pair of hose 61. In this case, the adjacent ends of the two sections would be supported by the arms 65 pivotally connected with the frame, as shown at 66, with the pivotal point in alignment with the pivotal points of the upper and lower arms, as clearly shown in Figure 3. This dividing of the brushes into sections is desirable where the brushes are used for polishing or cleaning bodies which have been painted with two or more colors, a section being provided for each color.

The brushes E for operating on the rear ends of the bodies are supported in substantially the same manner as are the side brushes, except that the arms 2' of these brushes are bent so that said arms will extend around the rear corners of the bodies and permit the brushes to contact the rear part of the body. The brushes E, at one side of the frame, have their pivotal points arranged in advance of the pivotal points of the rear brushes at the other side of the frame, as shown in Figure 2, so that the brushes at one side of the frame will operate on a part of the rear of the body before the

brushes on the opposite side of the frame contact said rear part of the body, thus preventing one set of brushes from interfering with the other set. This arrangement is clearly shown in Figure 2. The hose 67 for these rear brushes are connected with the ends of the pipes 32 by the valve connections 68 and valves 69 are provided for controlling the flow of fluid from the pipes 32 to the pipes 62 for the side brushes. These rear end brushes may also be formed in sections, as shown in the drawings, and as shown in detail in Figure 4. Of course, each brush may be formed of a single section which extends over the entire rear part of the body. All the brushes are formed to contact the entire surface with which they engage, the drawings showing the brushes with enlarged ends for fitting around the curved corners of the bodies.

Figures 12 and 13 show a laminated brush which is composed of the core 70 having a square bore for receiving the rod 24, with the long bolts 71 passing longitudinally through the bore for connecting the flanged cap 72 to the rear end of the core and the recessed cap 73 to the upper end of the core. The flanges of the caps 72 and 73 receive the laminated material 74 between them and bolts 75 pass through the flanges and the material to hold the material in place. The recessed cap 73 receives a portion of the ball race 26 and the bushing 25 and as will be seen, by pulling the rod 24 out of the assembly, the lower end of the brush can be tilted so as to draw the upper end away from the projecting race and other parts of the arm 1, so that the brush can be removed and another brush substituted therefor. It will, of course, be understood that the arm 1 is only made tubular when used for the upper brush, as otherwise it can be made solid, as shown in Figure 12.

Figures 14 to 18 show a sander brush and the parts thereof, and as shown in these figures, the core is composed of the two semi-circular parts 76, each having a groove at its center for forming a passage for the shaft 24 and with the longitudinally extending grooves 77 in its flat face, one on each side of the first mentioned groove, with a pair of strips 78 in the grooves of each pair, the strips of each pair being connected together by screws 79 or the like, with the edges of the sandpaper 80 or the like clamped between them. The ends of the core, formed of the two sections, are held together by the caps 81, the caps being fastened together and to the core by the long bolts 82 which pass through the two parts of the core and through the caps. Thus in this arrangement, the sandpaper or other material can be removed and replaced by new pieces whenever desired.

Each polishing brush is constructed as shown in Figures 7, 19, 20 and 21 and com-

prises the core 83 to which the polishing material 84 is suitably connected, with a cap 85 at each end of the core, with their flanges extending into circular grooves formed in the ends of the core. The caps are connected together by the long bolts 86 which pass through the core and through openings in the cap. The upper cap is placed in an opening in the top of the core so that the race and the parts carrying the same can enter the opening, as shown in Figure 7. A pin 87 can be used for fastening the shaft 24 to the lower cap of each brush, as shown.

Figure 6 shows diagrammatically how the invention can be used, and as shown in this figure, the bodies are propelled by any suitable means, with their rear ends foremost. The body first passes through the sander, the brushes of which are covered with sandpaper or the like, as shown in Figures 14 and 15, and then the body passes into the cleaner, the brushes of which are formed as shown in Figures 12 and 13. Then the body passes into the paint applying apparatus X and then into the oven X' and then the body passes into another sander and then through another cleaner and then through a polisher, the brushes of which are shown in Figures 7 and 19. It will, of course, be understood that all the cleaning, sanding and polishing devices are constructed as above described, though different brushes are used to carry out the different operations.

As the body enters a device, the side brushes will be pressed against the sides thereof by the springs and the top brushes are operated by hand to press upon the top of the body. Then when the rear of the body strikes the first one of the rear brushes, a portion of the rear of the body will be engaged by the first brush and then the other rear brush will engage the other portion of the rear of the body, as shown in Figure 2. When the cowl or hood part of the body is in a certain position, the front top brush is lowered by hand to engage said cowl part, as shown in Figure 1. When a coupé type of body is being operated upon, one of the top brushes is lowered to engage the top of the deck thereof, as shown in Figure 3. As before stated, the brushes must be formed to fit those portions of the body with which they are intended to engage and by providing a plurality of brushes of different forms, different types of bodies can be operated on by the brushes. When the sander brushes are being used, of course no liquid is supplied to the brushes from the tank, though compressed air can be supplied to the brushes to clean the same. When the body is passing through the cleaner, a cleaning fluid can be supplied to the brushes through the perforated pipes and connections shown, though these cleaning brushes can be used dry, if desired. When the body is passing through the polishing apparatus, polishing material

can be supplied to the brushes or these brushes can be used dry and the polish sprayed on the body.

With this invention, the bodies can be easily and quickly sanded, cleaned and polished at a low labor cost, as but a few workmen are needed to actuate the different parts of the apparatus, as all the brushes are operated by motors.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claim.

What I claim is:—

An apparatus of the class described comprising a frame open at its ends, brush carrying frames hingedly connected with the sides and top of the frame, each brush frame comprising a pair of arms pivotally connected with the main frame, with the pivots of the two arms in alignment, a gear on the pivot of one arm, a motor, a gear on the shaft thereon engaging the before mentioned gear, a shaft journaled in said arm and having a gear thereon meshing with the first mentioned gear, a brush shaft removably arranged in the outer ends of the arms, gearing connecting the shaft in the arm with said brush shaft, a brush having a centrally arranged bore receiving the said brush shaft, spring means connected with the brush frames at the sides of the main frame for pressing the brushes thereof against a body and means associated with the brush frames at the top of the body for adjusting the brushes thereof against the top portions of the body.

In testimony whereof I affix my signature.
MICHAEL VARGO.