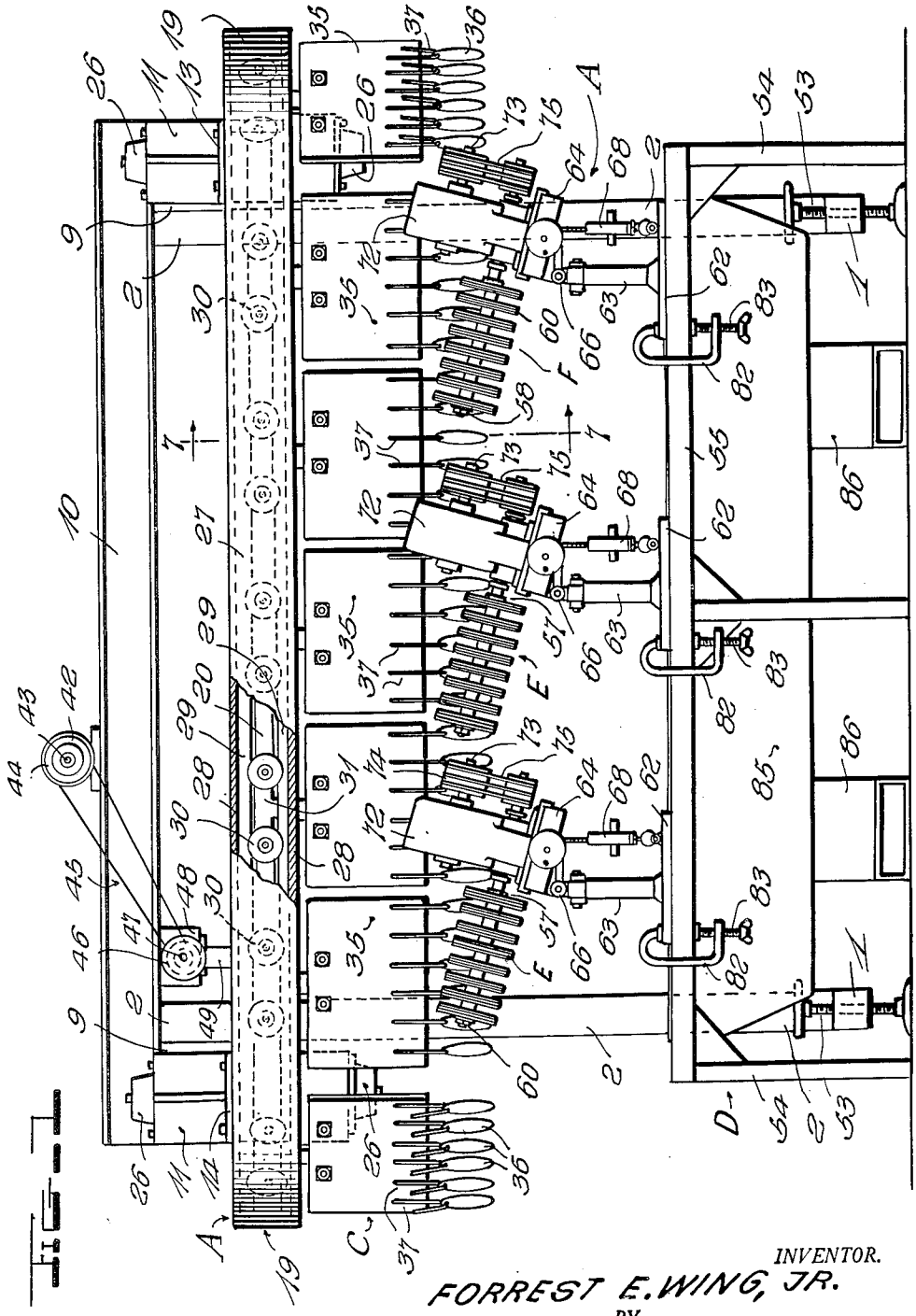
April 21, 1953 F. E. WING, JR 2,635,394

BUFFING MACHINE

Filed April 23, 1948 8 Sheets-Sheet 1



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BUFFING MACHINE

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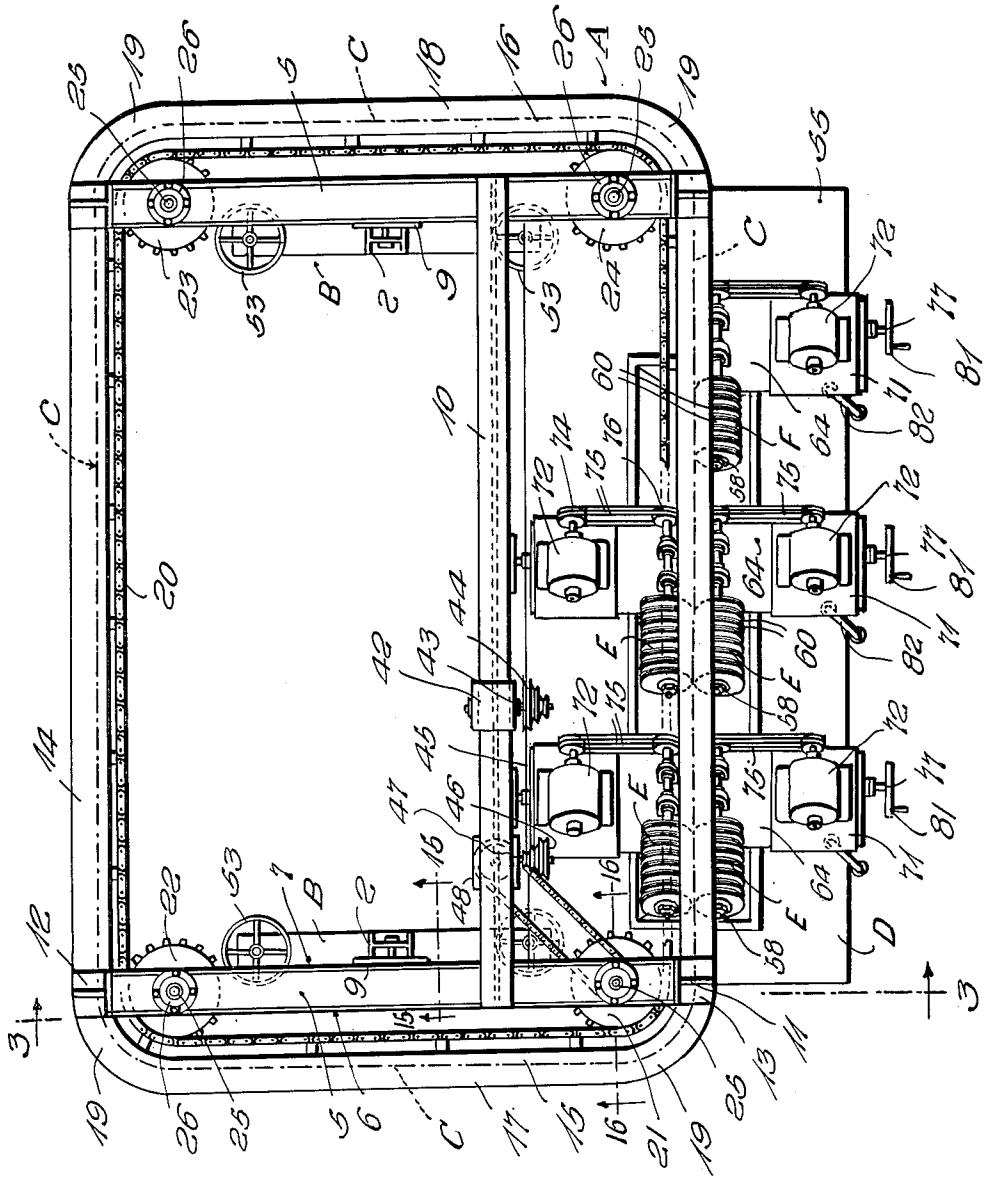


FIG. 2

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BUFFING MACHINE

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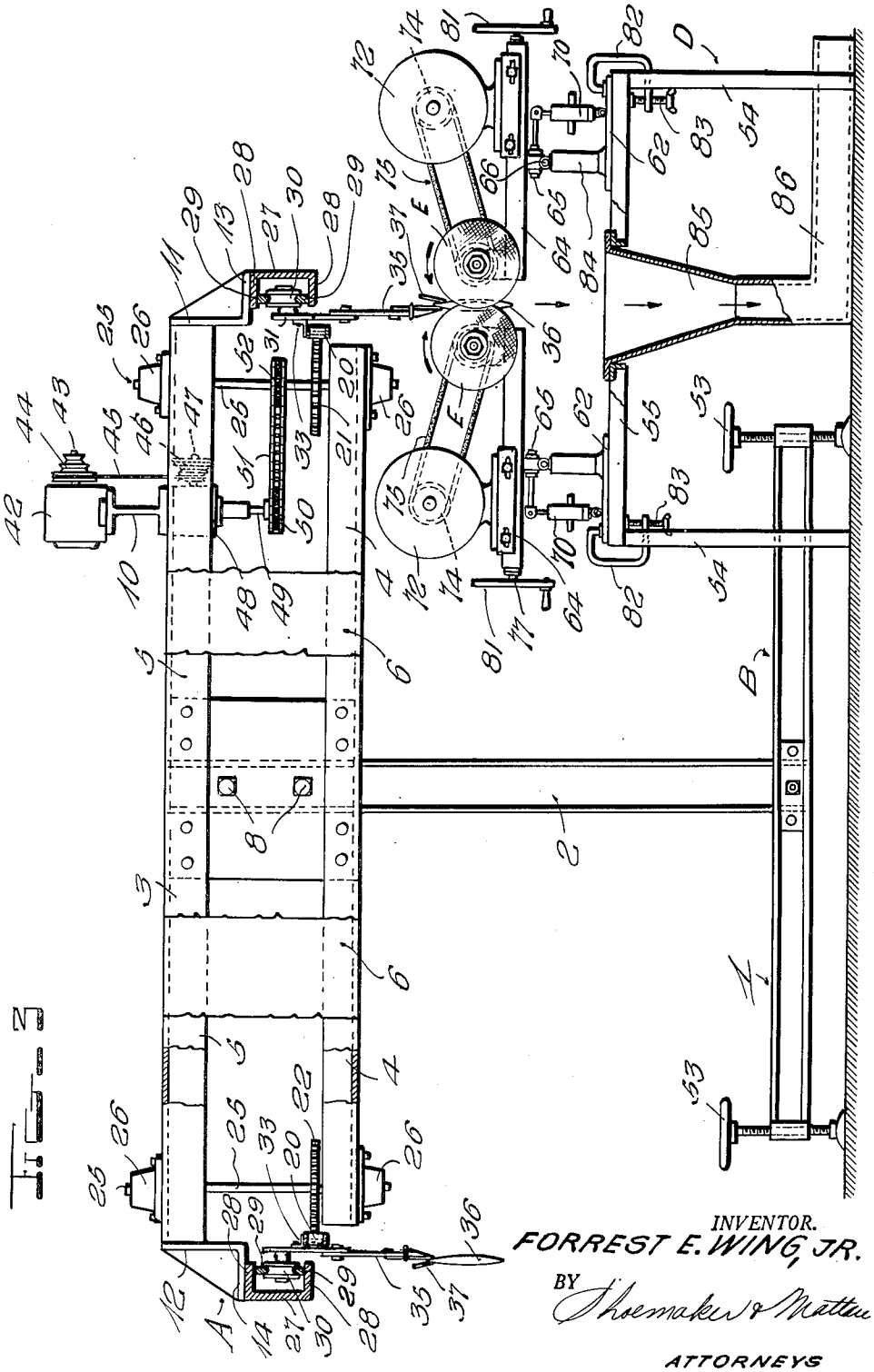


FIG. 2

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BUFFING MACHINE

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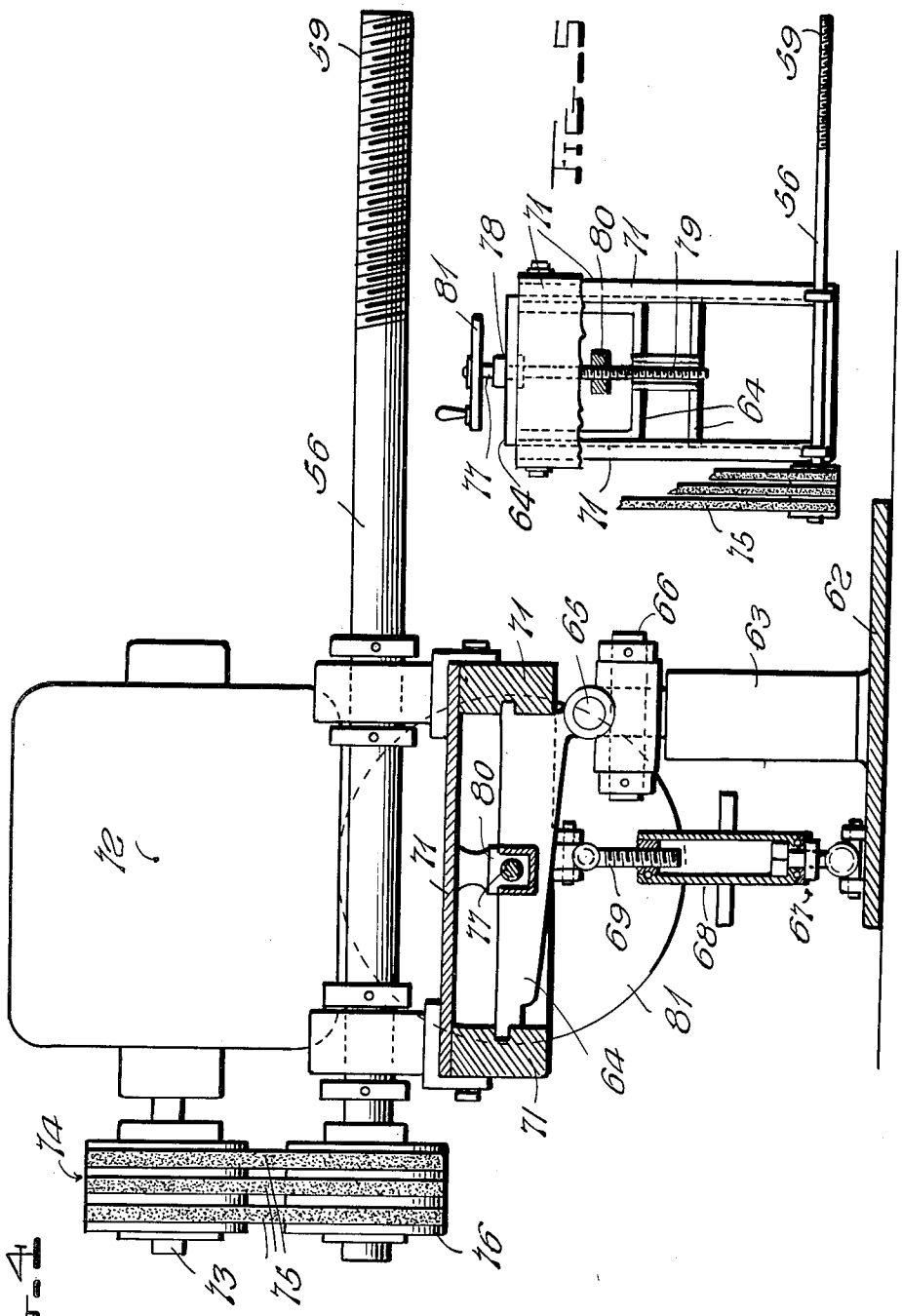


FIG. 4

FIG. 5

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BUFFING MACHINE

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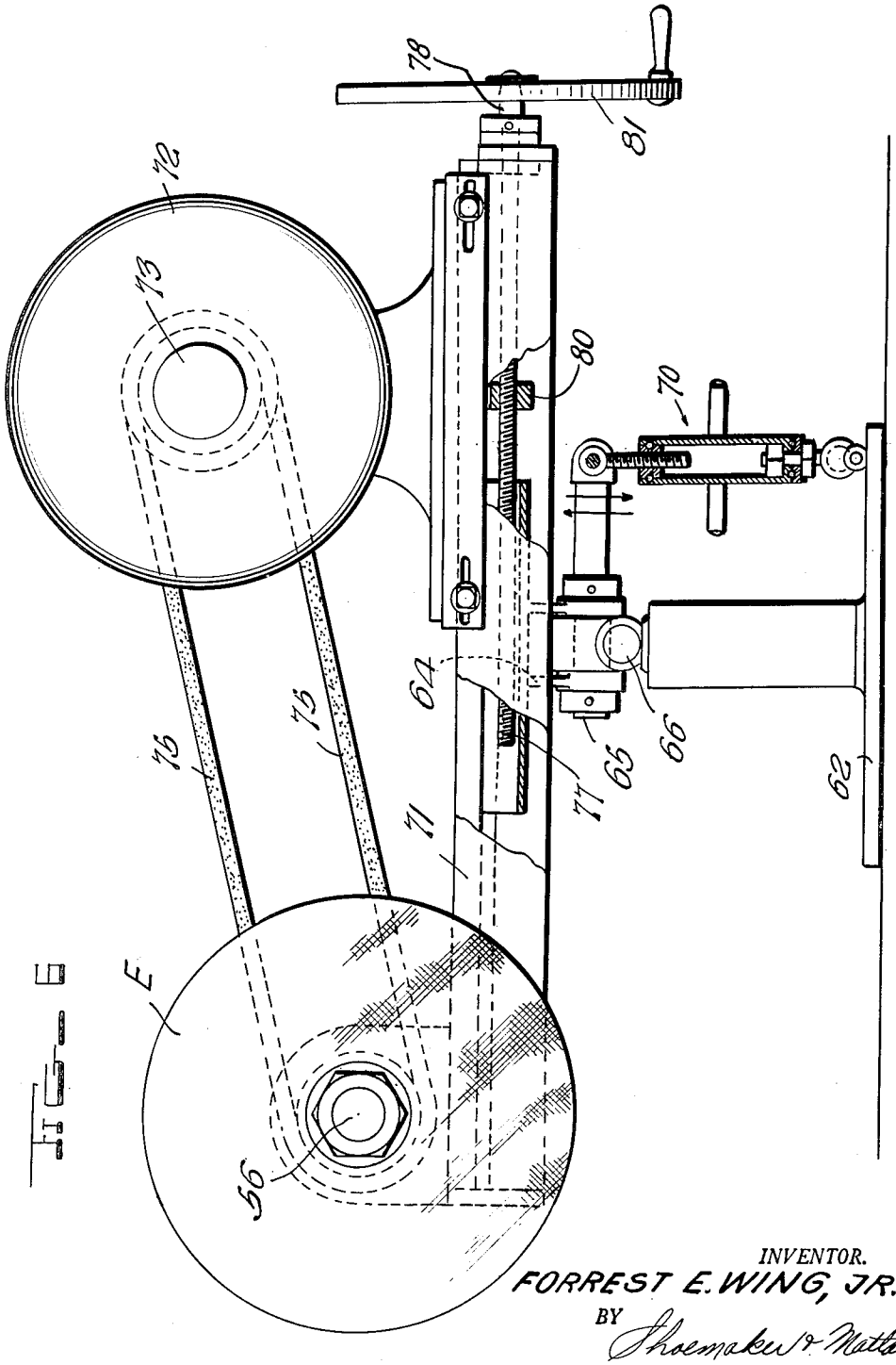


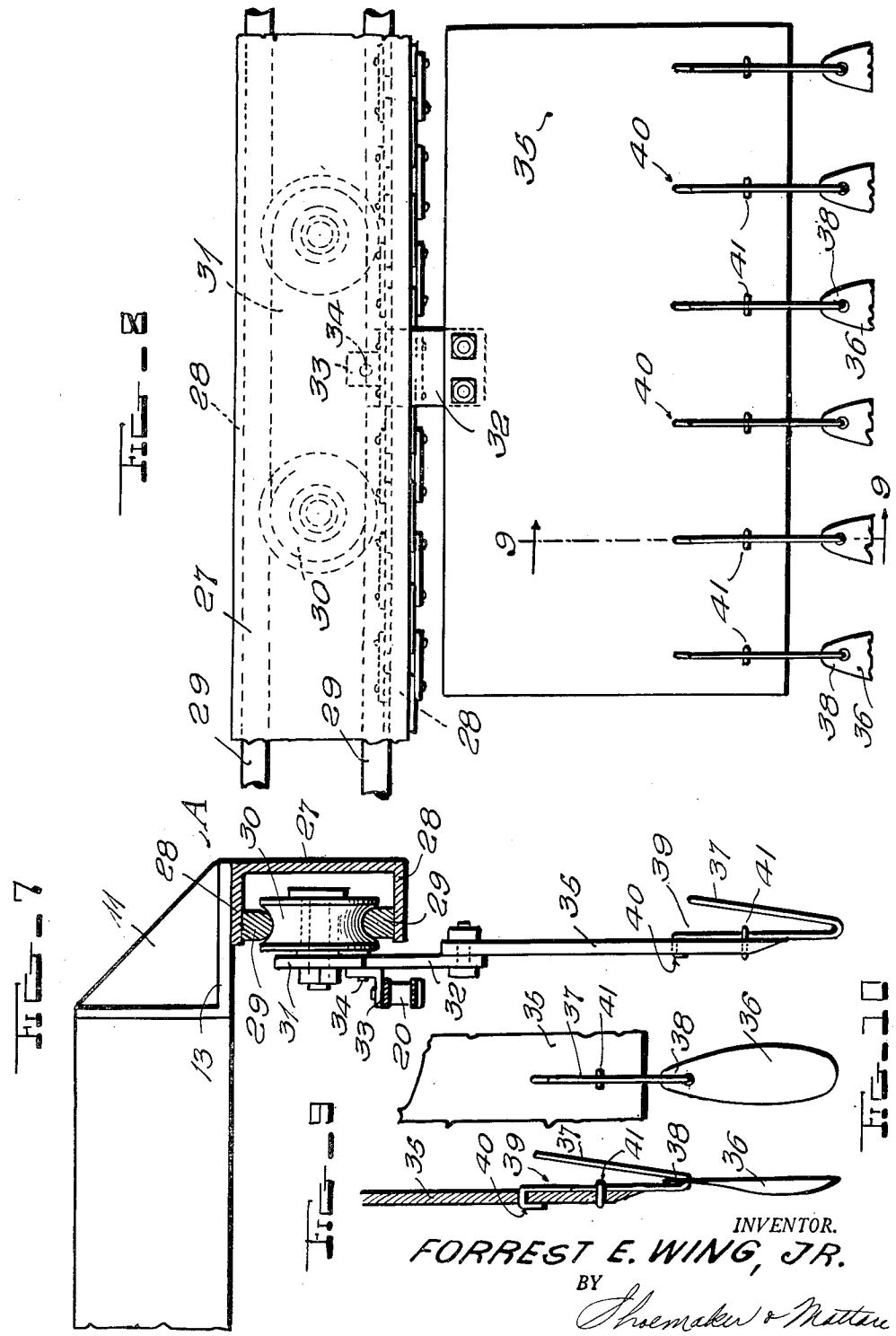
FIG. 5

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BUFFING MACHINE

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BUFFING MACHINE

Filed April 23, 1948 8 Sheets-Sheet 7

FIG. 11

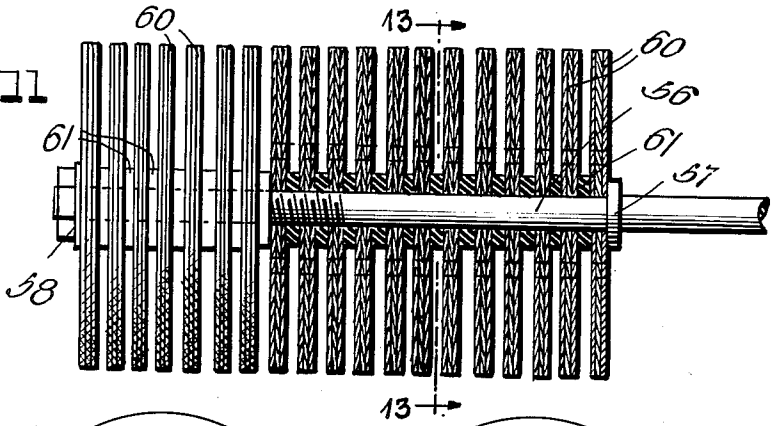


FIG. 12

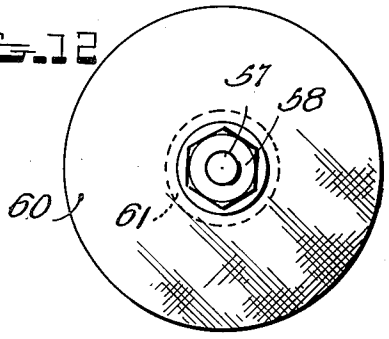


FIG. 13

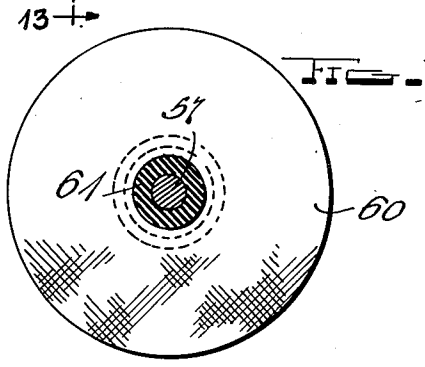
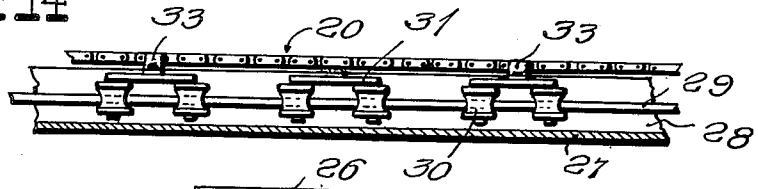
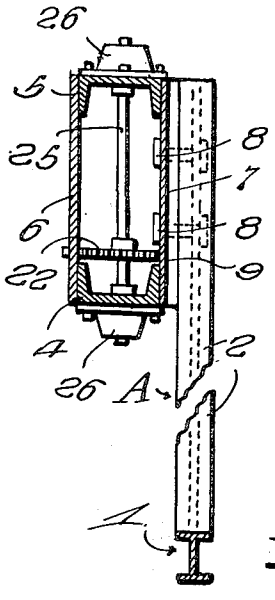


FIG. 14





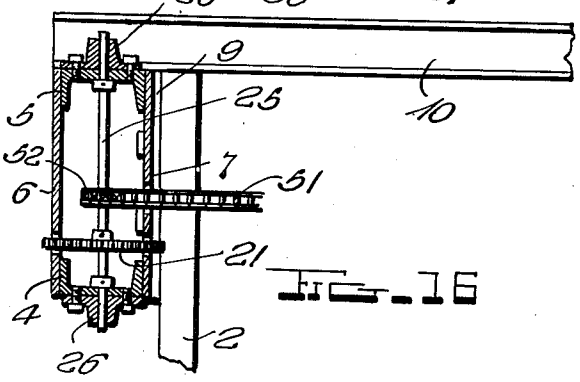


FIG. 15

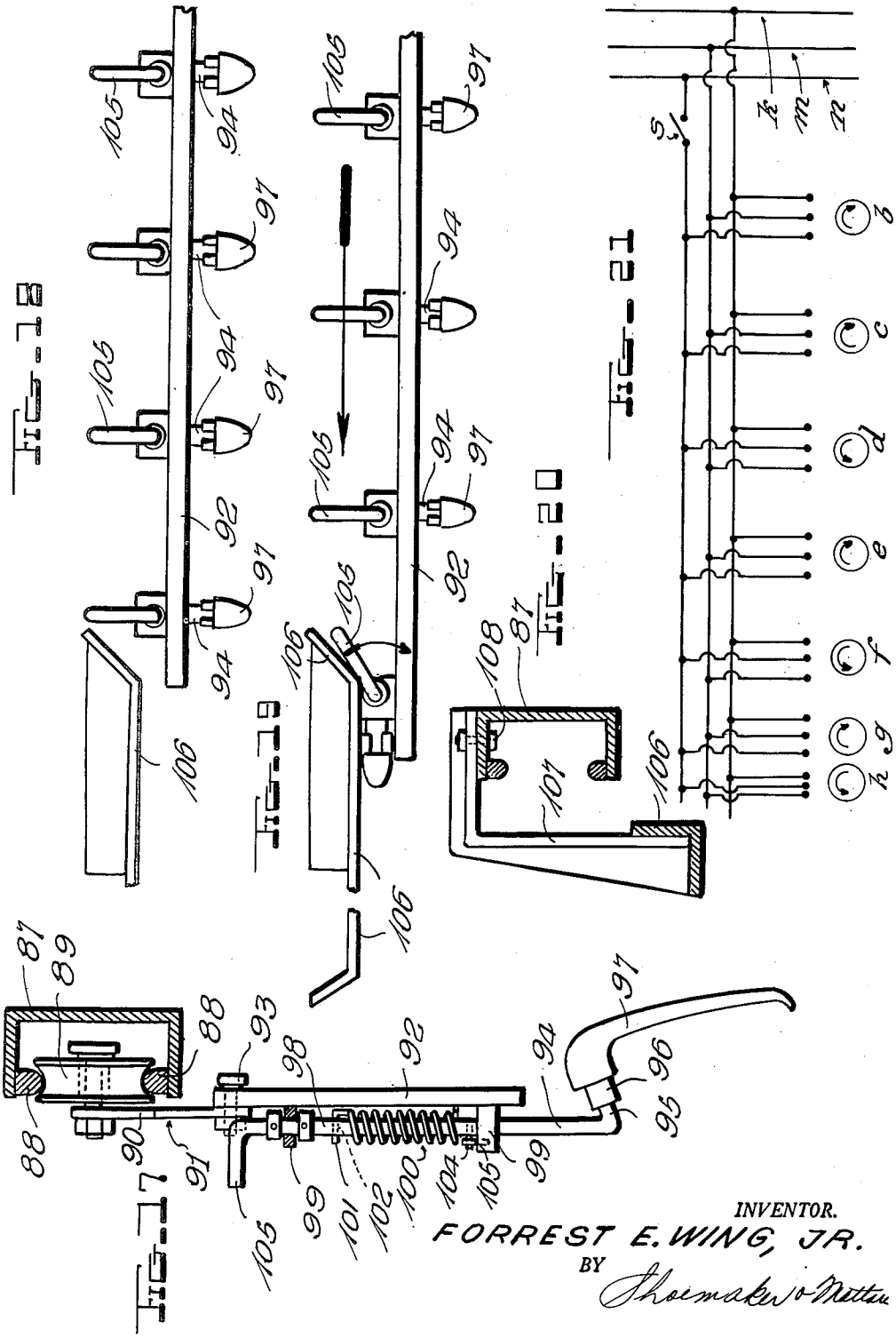
FIG. 16

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BUFFING MACHINE

Filed April 23, 1948 8 Sheets-Sheet 8



Patented Apr. 21, 1953 2,635,394

UNITED STATES PATENT OFFICE

2,635,394

BUFFING MACHINE

Forrest E. Wing, Jr., Tacoma, Wash.

Application April 23, 1948, Serial No. 22,859

10 Claims. (Cl. 51—80)

1

This invention relates to improvements in buffing machines for polishing or buffing metallic articles or parts, the same being especially adapted for buffing spinners for fishing tackle, automobile door handles and such like articles. It is understood that in the language of the trade, "polishing" and "buffing" are two individual and separate operations of finishing. However as the machine is readily adaptable to both operations, the words "polishing" and "buffing" are used interchangeably throughout this specification.

An object of the invention is to provide an improved machine whereby the operation of polishing spinners, automobile door handles, and like parts or articles can be rapidly and efficiently performed.

The invention contemplates a machine of the general type in which an endless conveyor is employed that is adapted to carry articles or parts to be buffed in contact with the buffing wheels, and another object of the invention is to provide in a machine of this general type improved conveying means whereby the articles or parts to be polished will be advantageously supported and presented to the buffing wheels.

Another object of the invention is to provide article hangers on the conveyor adapted to be turned and simple, efficient means for automatically turning the hangers to partially turn the articles during travel of the conveyor to present different parts of the articles to the polishing wheels.

Another object of the invention is to provide in a machine of the character referred to, means of simple construction for mounting the buffing wheels providing for supporting the same disposed at a forward and upward inclination longitudinally of and in a plane parallel to the path of travel of parts on a straight stretch of the conveyor, and for angular adjustment of the buffing wheels about an axis parallel to the path of travel laterally toward and from the path of travel of parts on the conveyor.

A further object of the invention is to provide an improved mounting for the polishing wheels that will provide for angular adjustment of the axes of rotation of the buffing wheels in a vertical plane longitudinally of the path of travel of a stretch of the conveyor to vary the forward

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inclination of the polishing wheels to the path of travel of parts on the conveyor, and also for angular adjustment of the buffing wheels about an axis parallel to the path of travel and for bodily rectilinear adjustment of the same laterally of the path of travel of the straight stretch of the conveyor to operate on articles or parts of various contours, and whereby the several adjustments of the buffing wheels can be easily and quickly effected and the machine set for operating on articles or parts of different contours and sizes, and to provide for wear of the polishing wheels.

A still further object of the invention is to provide an improved buffing wheel unit of simple, compact construction together with attaching means whereby a plurality of such units may be employed interchangeably at different points along a supporting frame at either side thereof and the path of travel of a straight stretch of the article conveyor.

The invention, with other objects, novel features, and advantages thereof, and the particular construction, combinations and arrangements of parts comprising the same will be understood from the following detailed description when considered in connection with the accompanying drawings forming part hereof and illustrating one embodiment of the invention.

In the drawings:

Fig. 1 is a front elevation of a buffing machine constructed in accordance with the present invention.

Fig. 2 is a top plan view.

Fig. 3 is a transverse section on the line 3—3 of Fig. 2.

Fig. 4 is a front elevation, with parts shown in section, on an enlarged scale of one of the polishing wheel units.

Fig. 5 is a detail top plan view of the mounting of one of the polishing units, the platform being shown broken away.

Fig. 6 is a side elevation, on an enlarged scale, of one of the polishing wheel units.

Fig. 7 is a transverse section, on an enlarged scale, on the line 7—7 of Fig. 1.

Fig. 8 is a fragmentary front elevation, on an enlarged scale, of the endless conveyor and supporting track therefor.

Fig. 9 is a vertical section on the line 9—9 of Fig. 8.

Fig. 10 is a front elevation of a portion of one of the hanger plates and an article supporting hook thereon.

Fig. 11 is a side elevation, on an enlarged scale, with part shown in section of one of the polishing wheels.

Fig. 12 is a front end elevation of one of the polishing wheels.

Fig. 13 is a transverse section on the line 13—13 of Fig. 11.

Fig. 14 is a top plan view, on an enlarged scale, of a section of the endless conveyor and supporting track therefor.

Fig. 15 is a detail vertical section on the line 15—15 of Fig. 2.

Fig. 16 is a detail vertical section on the line 16—16 of Fig. 2.

Fig. 17 is a side elevation of a modified form of article supporting means on the endless conveyor.

Fig. 18 is a top plan view of the cam bar and article supporting means shown in Fig. 17, the parts being illustrated before the rotatable hanger members are engaged by the cam bar.

Fig. 19 is a view similar to Fig. 18 but showing one of the hanger members in engagement with the cam bar.

Fig. 20 is a detail view of the mounting of the cam bar on the track frame.

Fig. 21 is a diagrammatic view of the electric circuit connections from the power line to sockets cooperating with plug connectors on conductors leading from the motors of the buffing wheel units.

While preferred embodiments of the invention are illustrated in the drawings, it will of course be understood that minor changes and modifications may be made in the particular constructions shown, and the invention may be embodied in other forms as will appeal to those skilled in the art and falling within the scope of the appended claims, without departing from the spirit of the invention.

Referring to a detailed description of the particular embodiment of the invention illustrated in Figs. 1 to 16, and 21 of the drawings, the construction shown includes a frame A having ends B, each composed of a base member 1, a standard 2 extending upwardly therefrom centrally of the ends thereof, and supports generally designated 3, secured to the upper ends of the standards 2. The base members 1 and the standards 2 are preferably, as shown, constructed of metal I beams. Each of the supports 3 consists of a pair of spaced channel members 4 and 5 connected at either side centrally of their ends by gusset plates 6 and 7. The upper supports 3 are secured to the standards 2 by bolts 8 or similar fastening members passing through the plates 8 secured to the standards 2 and through the inner gusset plates 7. The ends B of the frame are connected by a longitudinal beam 10, said beam fitting upon and being suitably secured to the upper channels 5 of the supports 3. The upper supports 3 are also connected with each other at their ends by L-shaped bars 11 and 12, each of these bars being disposed as shown with flanges 13 and 14 thereof extending outwardly horizontally. Similar L-shaped bars 15 and 16 are secured to and extend transversely along the outer sides of the supports 3, and L-shaped supports 15 and 16 each having one of their flanges 17 and 18 respectively extending outwardly horizontally in the same horizontal plane with the flanges 13 and 14 of the L-shaped members 11 and 12, the adjacent ends of the said flanges being connected by curved plates 19 forming continuations thereof and providing therewith a substantially rectangular shaped frame for supporting an endless conveyor C.

Referring now particularly to Figs. 2, 3, 7, and 8 of the drawings, the endless conveyor C includes a sprocket chain 20 engaging sprocket wheels 21, 22, 23, and 24 rotatably mounted on vertical shafts 25 secured at their upper and lower ends by nuts 26 to the supports 3 at the corner portions of the frame. U-shaped channel members 27 are secured to each of the horizontal flanges of the L-shaped bars 11 and 12, said channel members being disposed with their side flanges 28 extending horizontally and having suitably secured thereon upper and lower rails 29 providing tracks for trolleys 30 to which the sprocket chain 20 is connected. Each trolley 30 has a side plate 31 which is provided with a downwardly extending portion 32 intermediate its ends. The sprocket chain 20, at intervals along the same, is attached to the trolleys 30 by angular clip members 33, said clip members being secured as shown by bolts 34 to the depending portions 32 of the side plates 31 of the trolleys, and being riveted or otherwise suitably secured to the sprocket chain 20. Detachably secured to the depending portions 32 of the side plates 31 of the trolleys 30 are hanger plates 35 for the articles or parts to be polished. In the particular exemplification of the invention shown in which the hanger plates 35 are adapted for supporting spinners 36 for fishing tackle, each hanger plate 35 is provided at its lower end with hooks 37 adapted to be engaged by the eye portions 38 of the spinners 36. The hooks 37, which are conveniently constructed of wire, each have a shank portion 39 which has at its upper end a laterally extending portion 40, and the hooks are each secured to the hanger plates 35 by passing the laterally extending portions 40 of the same through an aperture in the hanger plate and then bending the outer end of the laterally extending portion back against the face of the hanger plate. The shank portions 39 of the hooks below the upper ends thereof are secured to the hanger plates by staples 41.

Mounted on the longitudinal beam 10 is an electric motor 42 for operating the conveyor C. On the motor shaft 43 is a step-pulley 44 connected by a belt 45 with a step-pulley 46 on a shaft 47 of a reduction gear 48 mounted on the longitudinal beam 10. On the take-off shaft 49 of the reduction gear 48 is a sprocket chain 51 with a sprocket wheel 52 fixed on one of the shafts 25, the sprocket chain 20 of the endless conveyor being driven through the sprocket wheel 21 on said shaft 25, this arrangement providing for driving the conveyor so that it travels at relatively low speeds, approximately seven and one-half, ten and three-quarters, and fifteen feet per minute. On each of the base members 1 of the frame A at opposite ends of said members, are jack screws 53 providing for vertical adjustment of the frame A.

Below the conveyor supporting frame A and extending forwardly thereof is a table-like frame D having legs 54 and a rectangular shaped top 55 said frame being arranged so that the vertical plane of the path of travel of spinners 36 or articles or parts carried on the forward straight stretch of the endless conveyor C (indicated by the dotted line in Fig. 1) is substantially midway the sides of the top 55 of the frame D.

On the frame D is a pair or pairs of polishing wheels E arranged side by side close together with the axes of the same lying in planes parallel to and at either side of the path of travel of article hanger plates 35 carried on the forward straight stretch of the conveyor, said polishing wheels engaging each other with a slight pressure and being disposed at a forward and upward inclination in a vertical plane parallel to the path of travel of article hanger plates 35 on said straight stretch of the conveyor so that the articles or parts are drawn by the conveyor C between and past the polishing wheels.

As many pairs of polishing wheels as desired may be employed, depending upon the type of work to be performed, two pairs being shown in the present instance and provision being made for using both pairs of buffing wheels in the polishing operation or the use of either pair separately, it being advantageous in different classes of work to use buffing wheels of different size and density. For example, in operating on nickel plate which is usually very thin and soft, it is desirable to use buffing wheels of smaller size and less density than when operating on articles of brass. Then again, it is desirable to use polishing wheels of different size and density when operating on spinners or other articles of simple contour than when polishing articles having more difficult and opposing contours. As will be appreciated, two pairs of polishing wheels facilitates change over from one kind of work to another and one pair can be used while the buffing discs of the other pair of wheels are being removed and others substituted. A single buffing wheel F is shown located in advance of the two pairs of buffing wheels E to operate upon the articles or parts to be polished separately from the pairs of buffing wheels, this being desirable in polishing certain kinds of articles or parts.

The buffing wheels may be of any of the well known standard constructions. Each of the buffing wheels is shown as composed of centrally apertured discs of cotton securely clamped together at their central portions on a shaft 56 between a collar 57 on the shaft and a clamp nut 58 eungaging a threaded portion 59 on the outer end of the shaft. In making up the buffing wheels, a number of the cotton discs 60 are sewed together near their central portions, about twenty of such discs for a quarter inch section. These quarter inch sections are threaded on the shaft 56 one by one with one or more small separator discs 61 of Bakelite being interposed between the cotton disc sections 60 depending upon the degree of flexibility desired. The threaded portion 59 of the shaft 56 is extended to about one-half the distance between the forward end of the shaft and the collar 57 to facilitate assembly of the cotton discs on the shaft.

A separate mounting is provided for each of the polishing wheels E and F that provides for supporting the same with its axis of rotation extending at a forward and upward inclination in a plane parallel to the path of travel of the hangers 35 on the forward straight stretch of the conveyor C at one side thereof, said mounting providing for angular adjustment of the polishing wheels in a vertical plane to different forward and upward inclinations in a plane parallel to the path of travel of hangers 35 on the forward straight stretch of the conveyor, and also for angular adjustment about an axis parallel to the path of travel and bodily adjustment rectilinearly toward and from the path of travel of articles or parts on the conveyor, said mounting being in the form of a compact unit and including a support for a motor for operating the polishing wheel, and attaching means being provided for detachably securing the buffing wheel units at different points along either side of the top 55 of the frame D.

As will be appreciated, the several adjustments of the buffing wheels provided for by the mounting for the same, together with the vertical adjustment of the conveyor supporting frame A through the jack screws 53 are of importance in providing for the positioning of the buffing wheels for efficient operation on articles or parts of different contours and sizes, and the machine is thus made practical for efficiently performing many intricate types of work. Also it will be noted that the simple compact form of buffing wheel unit adapted to be readily attached at different points along either side of the top of the frame D and used interchangeably with other similar units is of material advantage in adapting the machine for different classes of work.

Each of the buffing wheel units includes a base plate 62, a pedestal 63 on the base, a rectangular shaped frame 64 supported on the upper end of the pedestal, said frame at one side thereof having a rockable joint connection with the pedestal which preferably as shown comprises pivots 65 and 66 disposed at right angles to each other and providing for tilting the frame 64 about an axis perpendicular to the path of travel of articles or parts on the forward straight stretch of the conveyor C, and also for tilting the same about an axis parallel to the path of travel of the articles and toward and from the path of travel of articles or parts on the conveyor. For effecting angular adjustments of the frame 64 and to maintain the same in different positions of adjustment, an adjustable pivotal link connection 67 is provided between the frame 64 and the base 62 to one side of the pivot 65, the same including a turnbuckle 68 in threaded engagement with a threaded rod portion 69. A similar adjustable link connection 70 is provided between an extension of pivot 65 and the base 62 forwardly of the pivot 66 as seen in Fig. 6.

Slidably mounted on the frame 64 for adjustment longitudinally thereof is a platform 71 upon which is rotatably mounted at one end thereof the shaft 56 of the buffing wheel, said shaft being disposed transversely of the platform. The electric motor 72 for operating the buffing wheel is mounted on the platform 71 at the other end thereof, the motor shaft 73 having pulleys 74 thereon connected by belts 75 with pulleys 76 on the inner end of the buffing wheel shaft 56. Adjustment of the platform 71 is effected through a rod 77 rotatably mounted at one end at 78 on the frame 64 and having a threaded portion 79 engaging a threaded bore in a boss 80 projecting downwardly from the platform 71, the rod 77 having at its forward end a hand wheel 81 for turning the same. A clamp 82 is provided for each of the buffing wheel mountings to detachably secure the same to the top 55 of the frame D, the clamps being applied as shown with one arm thereof engaging over the base 62 of the mounting, and with its adjustable member 83 tightened up in engagement with the under side of the top 55 of the frame.

Referring now to Fig. 21 of the drawings, on the frame D, at intervals along opposite sides thereof, are provided electric socket connectors

to cooperate with plug connectors on conductor cords (not shown) leading from the motors 72 of the buffing wheel units. The motors 72 are designed to be operated from a three phase power circuit, the power supply lines being designated *k*, *m*, and *n*. Interposed in the circuit is a controlling switch *s*. The socket connectors *c*, *d*, *e*, and *f* (indicated diagrammatically in Fig. 21) to cooperate with the plug connectors of the motors operating the two pairs of buffing wheels E are appropriately connected to the power supply lines *k*, *m*, and *n* so that the buffing wheels of each pair are driven in opposite directions as indicated by the arrows in Fig. 3 of the drawings. The socket connector *b* for the plug connector of the motor that operates the single buffing wheel F is connected in the circuit as shown so that this buffing wheel will be driven clockwise. Two additional socket connectors *g* and *h* are provided so that the plug connector of the motor of any of the buffing wheels may be changed to one of the extra socket connectors *g* or *h* to reverse the direction of operation of the buffing wheel to facilitate placing the discs of cotton or the like on the shaft 56 of the wheels and removing the same therefrom. The threaded portion 59 of the shaft 56 of one of the wheels of each pair of buffing wheels E is a right-hand thread and the threaded portion of the shaft of the other wheel is a left-hand thread. Thus the wheels and nuts 58 have a tendency to tighten rather than loosen when the wheel is in active engagement with the work. In placing the buffing discs on the wheel shaft, the motor is started and with the shaft revolving in the proper direction with reference to the direction of the threads on the shaft, as the buffing discs and spacers are put on the end of the shaft, the threads draw them up to the smooth portion of the shaft and as more and more buffs are added they in turn force the first buffs on to the smooth part of the shaft. A slight pressure applied to the buffs will have a tendency to tighten the wheels. In removing the buffs from the shaft, the motor is operated to revolve the shaft in the reverse direction. Then with slight pressure applied to the buffs which are on the threaded portion of the shaft, they will roll right off.

The top 55 of the frame D has an opening 84 therein extending longitudinally intermediate the sides thereof. At the under side of the top of the frame and extending beneath the opening 84 is a bunker 85 to catch the buffing dust, said bunker having discharge pipes 86 extending from the bottom thereof and to which are connected conduits (not shown) having an exhaust fan associated therewith for carrying off the buffing dust to a suitable place of discharge.

As will be understood in the operation of the machine, spinners 36 or other articles or parts to be polished are placed on the hooks 37 of the hanger plates 35 of the conveyor C at that end of the machine shown at the right hand side of Fig. 1 of the drawings, the spinners being carried from the loading section of the conveyor forwardly and over the frame D and drawn between and past the pair or pairs of polishing wheels E, the spinners after being subjected to the polishing action of the wheels being carried forwardly therefrom to the other end of the machine where they are removed. The polishing of the spinners is expeditiously and efficiently performed by the machine. Provision is made for adjusting the polishing wheels to different forward and upward inclinations in a vertical plane longitudinally of and parallel to the path of travel of articles or parts on the conveyor and for angular adjustment about an axis parallel to the path of travel and bodily adjustment rectilinearly toward and from the path of travel of articles on the conveyor. These adjustments in conjunction with the vertical adjustment of the conveyor frame provide for the positioning of the buffing wheels for efficient operation on articles or parts of different contours and sizes, so that the machine is capable of efficiently performing on many intricate types of work. The various adjustments referred to can be easily effected. The machine can be speedily set for different classes of work, the simple, compact buffing wheel units being interchangeable one with another and readily attached to the frame D at different points along the same providing for varying the number of buffing wheels as desired to meet different conditions and being of material advantage in adapting the machine to different classes of work.

A machine constructed in accordance with the present invention has proven highly satisfactory in use. The polishing of spinners is rapidly and efficiently performed by the machine. An even scratch-free finish is obtained free from excess buffing compound. The finish obtained is comparable to the best finish obtainable by hand work, the work being accomplished in considerably less time and less cost over hand buffing and with a large saving in buffs and buffing compound.

In Figs. 17 and 20 of the drawings is illustrated a modified construction of hanger for suspending automobile door handles from the conveyor C. In this modified construction the hanger plates instead of having hooks fixedly secured thereto are provided with hooks that have their shank portions mounted on the hanger plates for partial rotation, and means being provided for automatically turning the hooks during travel of the conveyor to present different positions of the automobile door handles to the polishing wheels. In these views 87 designates the U-shaped channels on which are mounted the track members 88 for the trolleys 89, each having a side plate 90 provided with a depending portion 91 to which the hanger plates 92 are attached by bolts 93. In this modified construction, the article suspending hooks 94 have lower laterally extending end portions 95 adapted to have the socket portion 96 of an automobile door handle 97 fit thereon. The shank 98 of the hook is rotatably mounted in bearings 99 on the hanger plate 92. On the shank 98 of the hook is a coiled spring 100, one end 101 of which engages an aperture 102 in the hook shank, the other end 103 of said spring bearing against the face of the hanger plate. The spring 100 acts to yieldingly maintain the hook in the position shown in Fig. 17 of the drawings with the stop pin 104 on the shank 98 on the hook in engagement with the stop pin 105 of the bearing 99 of the hanger plate 92. The shank 98 of each of the article supporting hooks is provided at its upper end with a laterally extending arm 105 to cooperate with a longitudinally extending cam bar 106 on the track 87 to turn the hook through a quarter of a revolution when the arms 105 on the shanks of the hooks engage the cam bar during travel of the conveyor C. The cam bar 106 is suitably secured as by welding to the lower end of a hanger 107 which is detachably secured by bolts 108 to track 87, said cam bar being positioned with its forward end slightly in advance

of the first pair of polishing wheels E. As the articles or hangers are carried along from the loading end of the machine to the forward straight stretch of the conveyor, the hooks 94 are maintained by the spring 100 in the position shown in Fig. 17 to contact with the single polishing wheel F, this polishing wheel F being tilted inwardly toward the path of travel of the automobile door handles so that it will contact with and polish the end portion of the top and front face of the same. As the door handles pass the polishing wheel F and before they reach the first pair of polishing wheels E, the arms 105 on the shanks of the hooks engage the forward inclined end of the cam bar 106 and are turned thereby through a quarter revolution so that the sides of the door handles are presented to and are acted on by the pairs of polishing wheels E, the door handles being held in this position by the cam bar until the same pass both pairs of the polishing wheels, the springs 100 returning the hooks and door handles to the position shown in Fig. 17 when the arms 105 on the shanks of the hooks move out of engagement with the cam bar.

As will be understood, all that is necessary to change the machine for polishing automobile door handles instead of spinners or the like, is to remove the hanger plates that have the article supporting hooks fixed thereon as hereinbefore described, and substitute therefor the hanger plates 92 having the hooks 94 that are mounted for partial rotation. It will also be understood that when polishing spinners, the single forward polishing wheel F will be adjusted outwardly so as not to engage the articles.

What I claim is:

1. In a polishing machine, the combination of an elevated horizontal endless conveyor having means thereon for suspending therefrom articles or parts to be polished, said conveyor having a stretch thereof extending in a straight path, a polishing wheel, and a mounting for said polishing wheel supporting the same with its axis lying in a plane parallel to the path of travel of article suspending means on said straight stretch of the conveyor at one side thereof, said mounting including a base, a pedestal on the base, a frame on the upper end of the pedestal having a universal joint connection therewith providing for tilting the same about an axis perpendicular to the path of travel of the article suspending means on the straight stretch of the conveyor, and also for tilting the same about an axis parallel to the path of travel of said article suspending means and laterally toward and from the path of travel of said article suspending means on the conveyor, two screw threaded adjustable pivotal link connections between said frame and said base for effecting angular adjustments of the frame and to maintain the same in different positions of adjustment, and a platform on which the polishing wheel is mounted, slidable on said frame toward and from the path of travel of said straight stretch of conveyor, and means for moving said platform to different positions along said frame and for maintaining the same in different positions of said last mentioned adjustment.

2. In a polishing machine, the combination of an elevated horizontal endless conveyor having means thereon for suspending therefrom articles or parts to be polished, said conveyor having a stretch thereof extending in a straight path, a polishing wheel, and a mounting for said polishing wheel supporting the same with its axis lying in a plane parallel to the path of travel of the article suspending means on said straight stretch of the conveyor at one side thereof, said mounting including a base, a pedestal on the base, a frame on the upper end of the pedestal having a universal joint connection therewith providing for tilting the same about an axis perpendicular to the path of travel of the article suspending means on the straight stretch of the conveyor, and also for tilting the same about an axis parallel to the path of travel of said article suspending means and laterally toward and from the path of travel of said article suspending means on the conveyor, two screw threaded adjustable pivotal link connections between said frame and said base for effecting angular adjustments of the frame and to maintain the same in different positions of said angular adjustments, a platform on which the polishing wheel is mounted slidable on said frame toward and from the path of travel of said straight stretch of conveyor, means for moving said platform to different positions along said frame and for maintaining the same in different positions of said last mentioned adjustment, a motor on said platform having a drive connection with the shaft of the polishing wheel.

3. In a polishing machine, a frame, an elevated horizontally disposed endless conveyor having means thereon for suspending therefrom articles to be polished, said means including a series of plates, article hangers on each of said plates, each article hanger including a vertically extending rotatable shaft having a laterally projecting arm on the upper part thereof, a spring cooperating with said shaft to yieldably hold the same from rotation, a plurality of polishing wheels supported at different points alongside the path of travel of the article hangers, and a horizontally extending cam bar on said frame arranged to be engaged by the laterally projecting arms of the shafts of the hangers during travel of the conveyor to partially rotate the hangers to present different portions of articles on the hangers to certain of the polishing wheels.

4. In a polishing machine, a frame, an elevated horizontally disposed endless conveyor supported on the frame, article hangers on the conveyor each including a vertically extending rotatable shaft having a laterally projecting arm thereon, a spring cooperating with the shaft of each of the article hangers to yieldably hold the same from rotation, a plurality of polishing wheels supported at different points alongside the path of travel of the article hangers, and means on said frame arranged to be engaged by the laterally projecting arms of the shafts of the article hangers during travel of the conveyor to partially rotate the same to present different portions of articles on the hangers to certain of the polishing wheels.

5. In a polishing machine, a frame, an elevated horizontally disposed endless conveyor on the frame, said conveyor having means thereon for suspending articles to be polished, said means including a series of plates, an article hanger on each of said plates comprising a vertically extending rotatable shaft having a laterally projecting arm thereon, a coil spring on the shaft having one end fixedly secured to the shaft, and its other end bearing against said plate, a stop on said plate, and a part on the shaft adapted to engage said stop, said spring acting to yieldably hold the shaft against rotation with said

part on the shaft in engagement with the stop on the plate, and means on the frame to be engaged by the laterally projecting arms on the shafts of the hangers during travel of the conveyor to turn the same.

6. In a polishing machine, a frame, a horizontal endless conveyor on the upper part of the frame having means on the same for suspending therefrom articles or parts to be polished, jack screws on the lower part of said frame for raising and lowering the same, said conveyor having a stretch thereof extending in a straight path, a polishing wheel, a mounting for the polishing wheel supporting the same with its axis lying in a plane parallel to and at one side of the path of travel of the article supporting means on said straight stretch of the conveyor, said mounting being tiltable about an axis perpendicular to the path of travel of said article suspending means on the conveyor to adjust the polishing wheel to different forward upward inclinations relative to the path of travel of said article suspending means, and means for maintaining said mounting in different positions of said tilting adjustment.

7. In a polishing machine, the combination of an elevated horizontal endless conveyor having means thereon for suspending therefrom articles or parts to be polished, said conveyor having a stretch thereof extending in a straight path, a polishing wheel, and a mounting for said polishing wheel supporting the same with its axis lying in a plane parallel to the path of travel of article suspending means on said straight stretch of the conveyor at one side thereof, said mounting including a base, a pedestal on the base, a frame on the upper end of the pedestal having a universal joint connection therewith providing for tilting the same about an axis perpendicular to the path of travel of the article suspending means on the straight stretch of the conveyor to adjust the polishing wheel to different forward upward inclinations relative to the path of travel of the article suspending means on said straight stretch of the conveyor, and also for tilting the same about an axis parallel to the path of travel of said article suspending means laterally toward and from the path of travel of said article suspending means on the conveyor, and two screw-threaded adjustable pivotal links connecting said frame and said base for effecting said angular adjustments of the frame and to maintain the same in different positions of each of said angular adjustments.

8. In a polishing machine, a table-like frame comprising supporting legs and a top of general rectangular form, a second frame including a pair of end standards extending above the top of the first mentioned frame at opposite ends thereof, a horizontal endless conveyor supported on the upper part of the second frame and having means thereon for suspending therefrom articles or parts to be polished, said conveyor having a stretch thereof extending in a straight path longitudinally of and above the top of the table-like frame in a vertical plane intermediate the sides thereof, a polishing wheel and a mounting for said polishing wheel on the top of the table-like frame for supporting the polishing wheel with its axis lying in a vertical plane parallel to the path of travel of the article suspending means on said straight stretch of the conveyor at one side thereof, said mounting including a base, a pedestal on the base, a frame on the upper end of the pedestal having a universal joint connection therewith providing for tilting the same about an axis perpendicular to the path of travel of the article suspending means on the straight stretch of the conveyor, and also for tilting the frame about an axis parallel to the path of travel of said article suspending means laterally toward and from the path of travel thereof, means for effecting said tilting adjustments of the frame and for maintaining the same in different positions of adjustment, and means engaging the base of the mounting for detachably securing the same on top of the table-like frame at one side thereof at different points along the same.

9. In a polishing machine, a table-like frame comprising supporting legs and a top of general rectangular form, a second frame including a pair of end standards extending above the top of the first mentioned frame at opposite ends thereof, a horizontal endless conveyor supported on the upper part of the second frame and having means thereon for suspending therefrom articles or parts to be polished, said conveyor having a stretch thereof extending in a straight path longitudinally of and above the top of the table-like frame in a vertical plane intermediate the sides thereof, a polishing wheel and a mounting for said polishing wheel on the top of the table-like frame for supporting the polishing wheel with its axis lying in a vertical plane parallel to the path of travel of the article suspending means on said straight stretch of the conveyor at one side thereof, said mounting including a base, a pedestal on the base, a frame on the upper end of the pedestal having a universal joint connection therewith providing for tilting the same about an axis perpendicular to the path of travel of the article suspending means on the straight stretch of the conveyor, and also for tilting the frame about an axis parallel to the path of travel of said article suspending means laterally toward and from the path of travel thereof, means for effecting said tilting adjustments of the frame and for maintaining the same in different positions of adjustment, and means engaging the base of the mounting for detachably securing the same on top of the table-like frame at one side thereof at different points along the same, said last mentioned means comprising a U-shaped clamp member adapted to engage over the top of the base of the mounting, and a screw member on the clamp adapted to engage the underside of the top of the table-like frame.

10. In a polishing machine, a table-like frame comprising supporting legs and a top of general rectangular form, said top having an opening therein extending longitudinally thereof substantially midway its side edges, a second frame including a pair of end standards extending above the top of said table-like frame at opposite ends thereof, a horizontal endless conveyor supported on the upper part of said second frame and having means thereon for suspending therefrom articles to be polished, said conveyor having a stretch thereof extending in a straight path longitudinally of and above the opening in the top of the table-like frame, pairs of polishing wheels positioned at intervals along the table-like frame, the polishing wheels of each pair being arranged side by side at opposite sides of the vertical plane of said straight stretch of the conveyor, and a mounting for each of said polishing wheels supporting the same with its axis disposed at a forward inclination in a vertical plane parallel to the path of travel of article supporting means on the straight stretch of the conveyor,

the mountings for each pair of polishing wheels being disposed at opposite sides of the frame, and a bunker at the underside of the top of the table-like frame extending longitudinally beneath the longitudinal opening therein to receive buffing dust from the polishing wheels.

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