May 25, 1943. L. ILLMER ET AL 2,320,142

GRINDER MACHINE FOR STRIP STOCK OR THE LIKE

Filed July 14, 1941 3 Sheets-Sheet 1

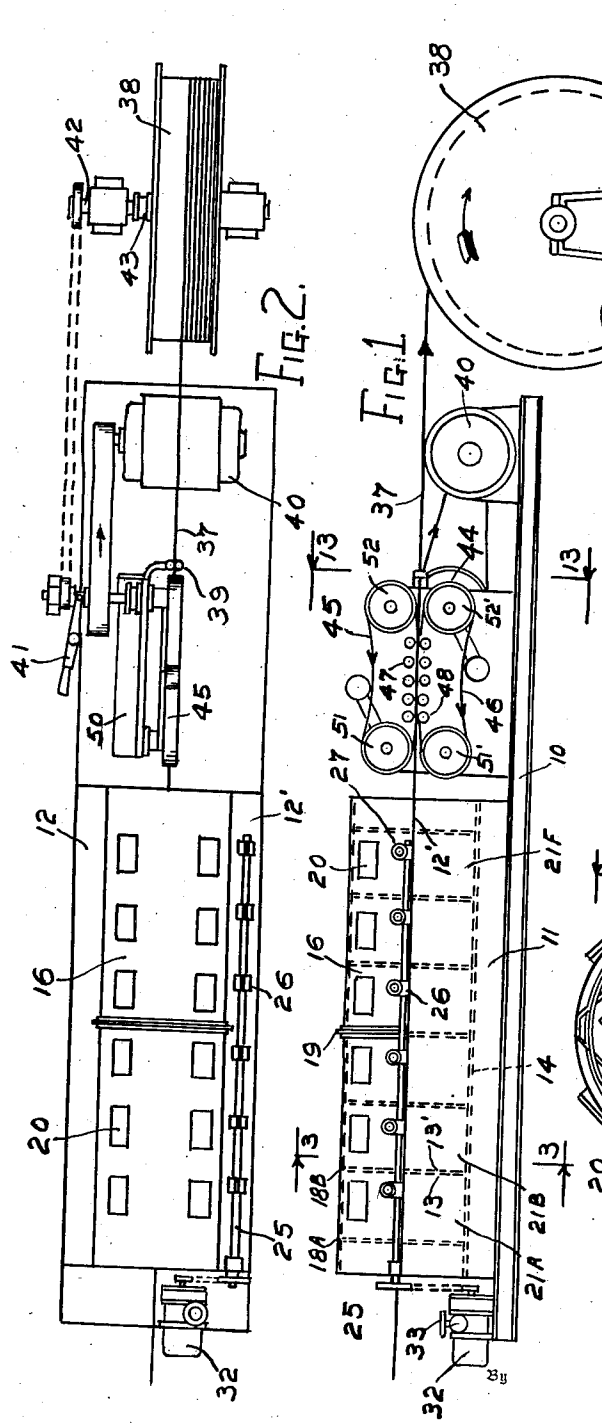


FIG. 2.

FIG. 1.

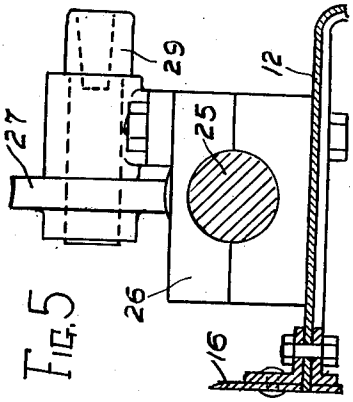


FIG. 5.

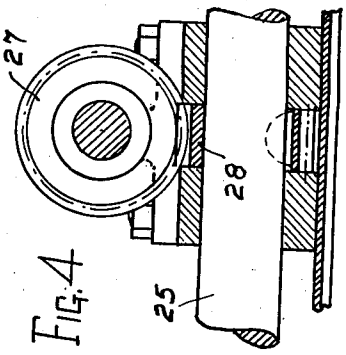


FIG. 4.

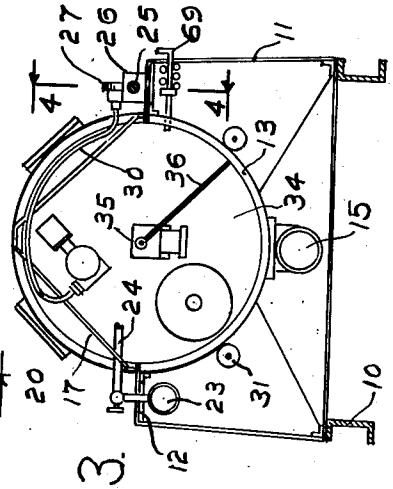


FIG. 3.

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GRINDER MACHINE FOR STRIP STOCK OR THE LIKE

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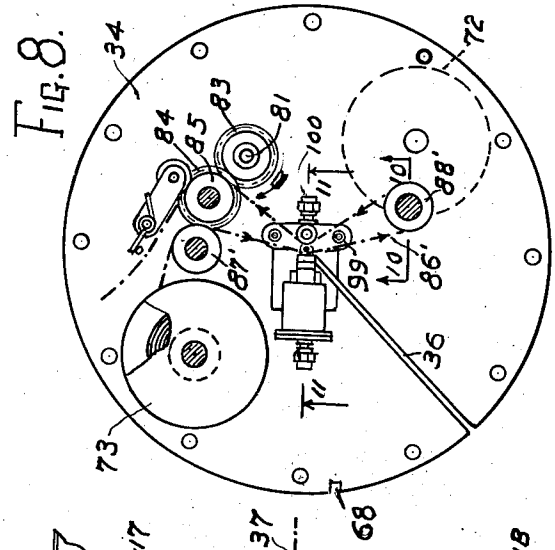


FIG. 8.

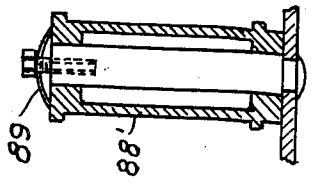


FIG. 10.

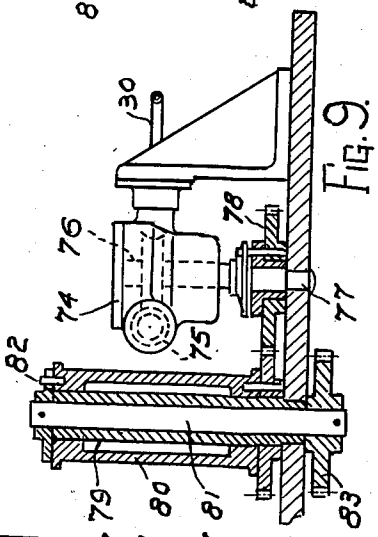


FIG. 9.

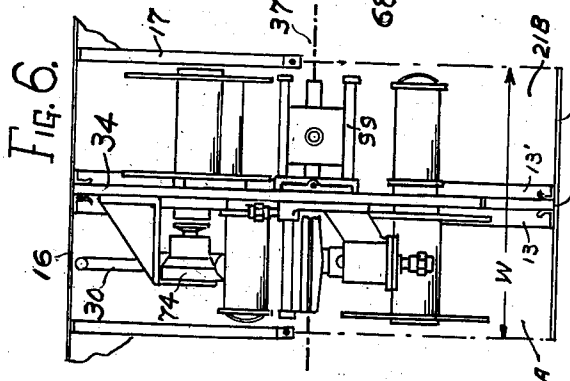


FIG. 6.

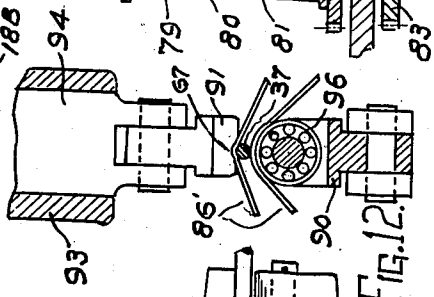


FIG. 12.

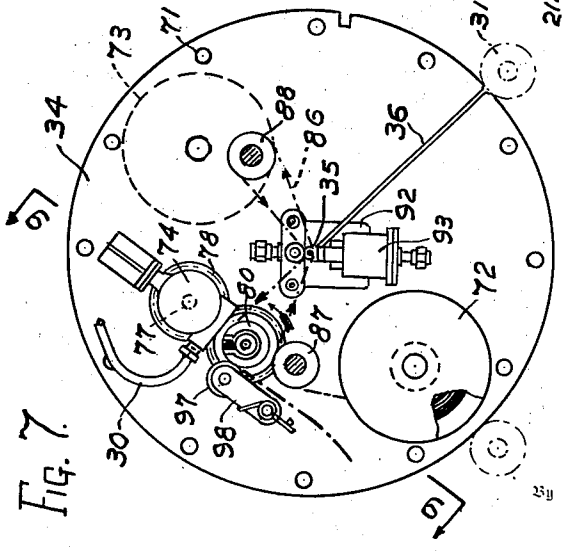


FIG. 7.

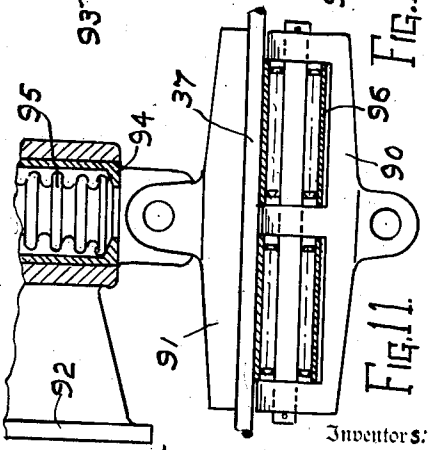


FIG. 11.

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GRINDER MACHINE FOR STRIP STOCK OR THE LIKE

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FIG. 14.

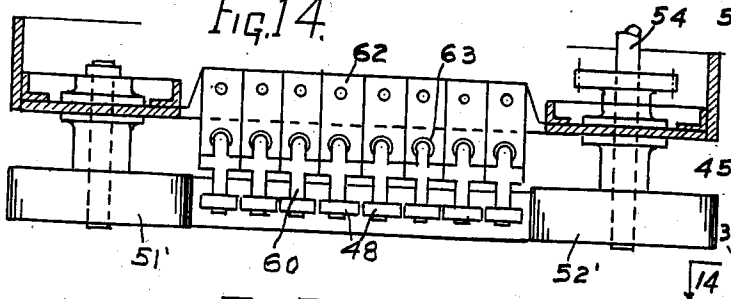


FIG. 16.

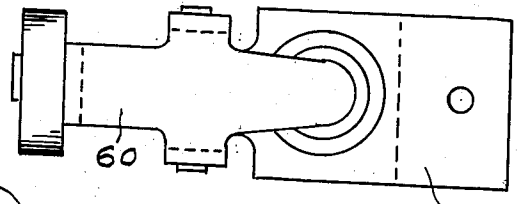


FIG. 13.

FIG. 15.

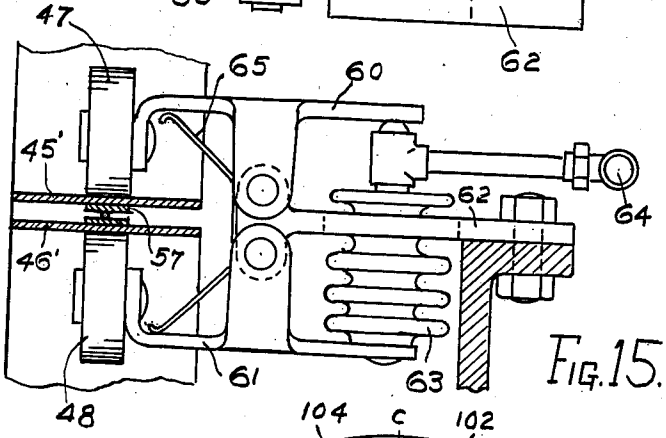


FIG. 17.

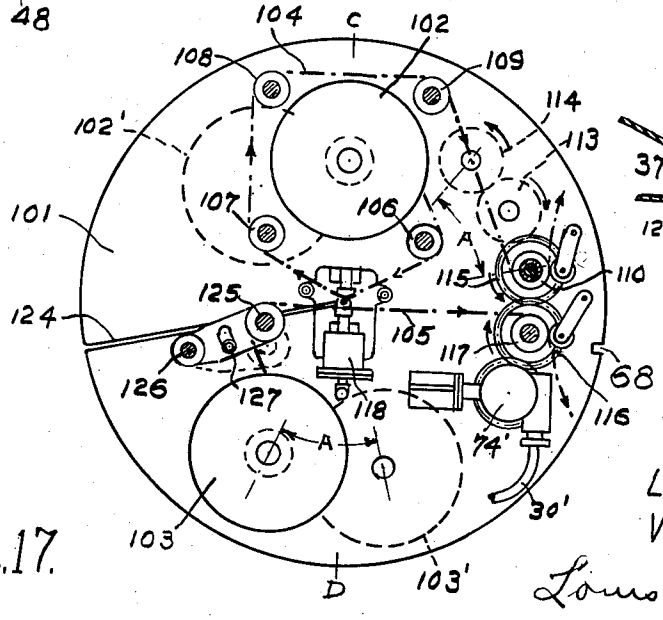
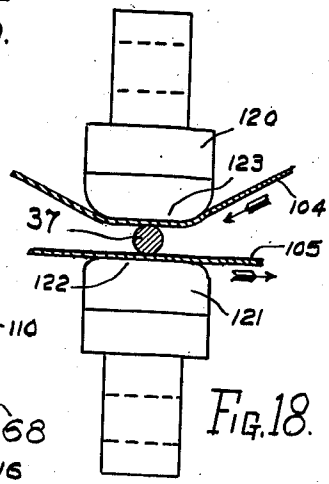


FIG. 18.



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Patented May 25, 1943 2,320,142

UNITED STATES PATENT OFFICE

2,320,142

GRINDER MACHINE FOR STRIP STOCK OR THE LIKE

Louis Illmer and Vernon R. Pallas, Cortland, N. Y.; said Pallas assignor to Leota T. Pallas

Application July 14, 1941, Serial No. 402,352

15 Claims. (Cl. 51—150)

This invention relates to a commercially practicable surface finishing apparatus in which abrasive tape is effectively utilized, and more especially pertains to an improved non-rotating head type of machine adapted to rapidly apply a lustrous metallic polish to fast moving round or flat strip stock, butt welded rods or other reelable products when dragged longitudinally through our compact machine in one or more passes. The present compartment type of machine is particularly designed to efficiently grind and highly polish hardened piano, stainless steel wires or the like high tensile strip stock without requiring any fast moving parts except for the treated wire itself and its drag mechanism.

The instant specification represents certain improvements over our copending application Serial No. 366,596 as filed November 22, 1940, and similarly resorts to a series of laterally spaced bulkheads or stationary frame plates, respectively having mounted thereon angularly staggered abrasive tapes arranged to treat cross-sectionally flat or round work pieces. A prefered product velocity of several thousand feet per minute affords a fast productive rate for a given collective width of active tapes and results in proportionately low machine and product costs.

The present machine further comprises a plurality of independently demountable disc units, each equipped with a full complement of tape feed roller devices. Each such self-contained, stationary disc is herein provided with novel flexible drive shafting for actuating the tape feed roller means, the discs being mounted into a horizontal split housing having circular guideways in which the disc units may respectively be upheld and manually rotated for servicing. A radial slot provided in each disc permits of independent disc removal without having to withdraw the common wire that is centrally threaded therethrough.

The object of our invention is to devise an improved compartmental machine of the indicated character capable of coordinately utilizing numerous abrasive tapes for combined intensive grinding at a rapid productive rate on a low cost output basis. Embodied herein are also other structural refinements that allow of crowding such tapes within a comparatively small overall dimension and otherwise facilitate the end in view.

Reference is had to the accompanying three sheets of drawings which are illustrative of preferred exemplifications, and in which drawings:

Fig. 1 represents an elevational side view of a single split housing assembly and associated reel parts embodying our invention, and Fig. 2 a top view thereof.

Fig. 3 is a cross-sectional housing view taken along 3—3 of Fig. 1.

Fig. 4 details a gear bracket for driving a flexible shaft as taken along 4—4 of Fig. 3, while Fig. 5 is an end view thereof.

Fig. 6 shows an edge view of a demountable disc bodily removed from the housing and having its mated control accessories attached to the respective side faces.

Figs. 7 and 8 respectively depict opposed face views of the assembled discs.

Fig. 9 is a fragmental cross-sectional view taken along 9—9 of Fig. 7, and Fig. 10 represents a similar view taken along 10—10 of Fig. 8.

Fig. 11 represents a fragmental view of the tape clamping jaws along 11—11 of Fig. 8, and Fig. 12 shows a transverse section of said jaws.

Fig. 13 is an elevational assembly of our wire grip mechanism as seen along 13—13 of Fig. 1, and Fig. 14 is a top view thereof.

Figs. 15 and 16 detail one of the roller units comprised in such mechanism.

Fig. 17 illustrates a housing disc provided with a modified tape roller arrangement, and Fig. 18 reveals the jaw details associated therewith.

Referring more specifically to these disclosures, our split housing may be fabricated in sheet metal to comprise a pair of laterally spaced foundation rails such as 10 having a base 11 mounted thereacross (see Fig. 3). The upright longitudinal side walls of said base may respectively be inturned to provide for skirt ledges 12 and 12' which may constitute the parting plane of said housing. Bridging these ledges are a series of depending twin flanges such as 13 and 13' (see Fig. 6) that may be given a semi-circular angle iron shape and the outer perimeter of which angles may be welded to the trough shell 14. An ejection pipe 15 may vent said trough and carry off abraded waste products.

A superimposed semi-cylindrical cover sheet 16 may be cross braced by the struts 17 and bolted in place to span said ledges as shown. This crowned cover may be equipped with a series of twin angle iron ribs that successively register with the corresponding base elements to provide for a plurality of endless disc receiving grooves or guideways 18A, 18B, etc. For convenience of

handling, said cover may be segmentally coupled as at 19. An inspection hand hole 20 may be provided intermediate each next adjacent pair of guideways to gain access to the successive housing compartments such as 21A, 21B, etc.

A compressed air or the like fluid supply pipe 23 may run beneath one ledge and be provided with controlled branches 24 leading to each housing chamber. Mounted upon the other ledge is a driven line shaft 25 of which the several brackets 26 may respectively carry a worm 27 for each chamber. A cooperating worm gear 28 slowly drives a transverse stub spindle 29 which may be socketed for the reception of the laterally flexible shafting 30 including a stationary armor having a driven core rotatably mounted therein. A motorized variable speed transmission unit 32 having a finger tip control 33, may chain drive one end of the line shaft 25 to impart a very slow but controlled rotation to said line shaft and its several gear-connected flexible shaftings 30. Such coupled spindle and shafting constitute disconnective transmission means arranged to facilitate the independent removal of any one housing partition.

Entered into each of the guideways 18A, 18B, etc. is a stationary partition disc 34 of sheet metal, the respective discs being centrally apertured at 35 and having a radial slot 36 extending to the disc perimeter. An elongated work piece 37 preferably of reelable round or flat metallic ribbon-stock, may be threaded endwise through the respective disc apertures. Each disc may be pivotally carried upon a pair of trunnion rollers such as 31 which facilitate upturning their respective slots into registry.

As schematically indicated in Figs. 1 and 2, a driven take-up reel 38 equipped with conventional level winder means, may be located at the aft end of our housing, it being understood that the strip stock is to be alignedly fed off a brake loaded companion supply reel (not shown) located at the fore or opposite housing end.

If desired, the strip stock may be straightened, and wound on a demountable supply reel in sufficiently long lengths to keep our machine in operation for a protracted time period. To this end, adjacent terminals of a series of component wire or rod lengths may be butt welded and wrapped in layers on an appropriate supply reel. A suitable lead wire may be included for initially wrapping the respective drums. A pair of lateral guide rollers 39 serve to maintain the treated wire in proper axial alignment with the several disc apertures 35 while being reeled. When handling high tensile straightened wires or rods up to about one-fourth inch in diameter, it is expedient to resort to correspondingly large reels that shall not impose a permanent set to the wound wire.

Special provision has been made to rapidly drag said wire longitudinally independently of the off-take reel pull and thus afford adequate cutting action for our slowly fed polishing tapes. A primary motor 40 is shown belt driven to a main clutch pulley 44 provided with the control lever 41. One end of the main pulley shaft may be chain driven to the take-up reel shaft 42 which in turn is equipped with an adjustable slip clutch 43. The tensioned wire when longitudinally advanced through many tapes having a collective width substantially equal to the housing length, is subjected to drag of considerable magnitude likely to mar a lustrous superficial finish when wire is to be closely wound in deep layers and dragged solely by a power driven take-up reel.

By the use of driven supplementary belts such as 45 and 46 respectively cooperating with numerous opposed backing grip rollers 47 and 48 and having the work piece interposed between, the take-up reel may be relieved of its usual drag duty. The reel 38 is preferably geared to overtravel its drum perimeter by slip on part of the clutch 43 whereby to keep the wire taut without slackening as it leaves the last grip roller in the arrowed travel direction.

Referring in detail to Figs. 13 to 16, such grip mechanism may be inbuilt into a sheet metal framework 50 in which two pairs of axially spaced pulleys 51 and 52, also 51' and 52', may respectively be installed upon separate axles horizontally extending crosswise of the treated wire. The upper and lower aft axles 53 and 54 may be superimposed in parallelism and have the motor driven main pulley 44 mounted on one such axle. A train of gears 55 interconnects these axles for simultaneous rotation in reversed directions. A set of upper and lower fore counter axles may be similarly disposed but without gear connection, since these may be independently driven by the lap spliced endless belts 45 and 46 in the Fig. 1 fashion.

Opposed belt tighteners may serve to keep taut the next adjacent belt sections 45' and 46' that move in a like direction. As indicated in Fig. 15, these spaced superimposed belt faces may be of adequate width to transmit the required power to a heavily dragged wire. Snugly circumscribing each belt 45 and 46 is a dressable grip strap 57 and 58 between which a round or flat work piece may be frictionally clamped. Such endless strips are preferably made of high grade chrome leather with a shallow initial groove therealong and replaceably glued to the exterior of its pulley driven belt.

In order to releasably control the grip of the interposed wire, a series of upper and lower backing rollers such as 47 and 48 may be fluid actuated by the use of the reversely pivoted yokes 60 and 61. A bracket plate 62 may be removably clamped to an upright plate of the framework 50 to overhangingly carry said yokes thereon as shown. Each outer yoke end is provided with a high speed backing roller preferably of the ball bearing type since its radially loaded outer race perimeter must rotate at belt velocity which is kept identical with the rate of the desired wire travel of more than one thousand feet per minute. A metallic bellows or the like diaphragm means 63 may be interposed between the inner yoke ends. The thrust of the several retractible roller pairs may be controlled in unison by the interconnected fluid supply pipes such as 64 that lead to a branch 24.

A yoke spring 65 may automatically relieve the roller thrust after the fluid supply is cut off. In lieu of the described bellows equivalent resilient means may be resorted to, it being the intent to afford a tight grip that will not mar polished wire or strip stock and without substantial clutch slip, still dominate the anticipated tape drag through the Fig. 1 housing. The use of such closely spaced opposed rollers when cushioned by leather or the like agency, effects a well distributed clamping grip on the wire.

In the case of tandem units, their respective grip mechanism serve to distribute the required drag of the treated wire through the several housings and deliver the same into the next housing substantially relieved of drag tension. In such tandem arrangement, it is preferred to

gear interconnect all the grip pulleys to run in unison from a common motor by means of an equalizing drive.

Attention is now directed to Figs. 6 to 12 in which the first named reveals the novel manner in which our independent spool carrying units may be dropped into any particular split housing groove such as 18A, 18B, etc. Each such unit comprises a demountable circular disc 34 of sheet metal of which the perimeter may be provided with a keyway 68 that when properly located falls into registry with a retractible bolt 69 disposed near the housing parting plane (see Fig. 3). Upon removal of the disc embracing segmental cover 16 and withdrawal of said bolt, the disc may be freely rotated manually about its centralized wire receiving hole 35. The successive keyed disc assemblies are intended to be angularly staggered and locked to bring their respective tapes in proper relationship to uniformly abrade the entire superficial surface of the treated wire 37. After disengaging the flexible shafting 30 from its socketed stub spindle 29, and breaking the air supply connections, the narrow disc slot 36 allows of selectively demounting any one disc assembly while the wire 38 remains threaded through the other units. After bodily removal from its groove by the use of the disc pry holes 71, the associated tape spools of any one disc may be conveniently reloaded or a stocked substitute disc may be inserted in lieu of a spent disc. Such independent hoisting not only facilitates servicing but permits adjacent discs to be closely spaced apart at the minimum of clearance. In lieu thereof, the several discs may also be additionally spaced laterally and manually rotated to bring their cleared spools uppermost without having to bodily demount any of such discs for tape replenishment.

The stationary discs may each carry reversely disposed tape spools 72 and 73 respectively, as will be seen from the assembled face views in Figs. 7 and 8. These layouts are substantially identical except for being shifted angularly to partially counterbalance the tape clamping thrust against the treated work piece. The Fig. 9 disc side face has bracketed thereto an angle head casing 74 that preferably mounts a head worm 75 and a cooperating worm gear shaft 76, which latter is disposed in parallelism with the spool spindles. Axially aligned with said gear shaft, is a fixed solid stanchion 77 about which rotates the drag gear 78 provided with a pin that is driven from said worm shaft. The worm 75 is preferably actuated through an individual flexible shafting 30 which in turn may be selectively rotated by the common transmission unit 32.

A fixed tubular stanchion 79 has an end riveted into one such disc face. Rotatably surrounding said stanchion is a driven feed roller 80 of which the disc end is provided with a gear that meshes with the drag gear 78. A stub shaft 81 is rotatable interiorly of said stanchion and may be carried along with the feed roller by the drag pin 82. The overhanging inner end of said stub shaft extending through the disc, may be provided with an intermediate gear 83 that meshes with the roller gear 84 to drive its flanged feed roller 85 located upon the opposite disc face. The aim is to utilize a single angle head for each disc assembly and to simplify the required severable connections associated therewith. The arrowed directions indicate the respective gear rotations. In addition, each face layout may be provided with a pair of flanged idler rollers such as 87 and 88 (or 87′ and 88′) which guide their respective single tapes 86 or 86′ into operative position about the treated wire. As shown in Fig. 10, one such idler roller namely 88 or 88′, may have one end thereof equipped with an adjustable spring clip 89 which imposes a retarding drag on the advancing tape.

As a further refinement, we preferably but not necessarily resort to a pair of centrally pivoted companion shoes or tape clamping jaws 90 and 91. A bracket flange 92 may be attached to the center region of each disc side face as shown and respectively provided with an overhanging bored jacket 93 in which is mounted a tubular slide 94. Said slide may be pneumatically actuated by a metallic bellows agency 95 to thrust the longitudinally grooved shoe 91 toward the treated wire 37 and which bellows is pipe connected to a branch supply 24. The opposed complementary backing shoe 90 may be provided with relatively small diameter roller means 96 in the manner depicted in Figs. 11 and 12. Such needle bearing means allow the tape to be directed thereover at a sharp acute angle without abnormal binding effects or tendency to tear.

In the present instance, a single tape of considerable width may be mounted upon each disc side face and respectively disposed to appreciably wrap circumferentially about the treated stock in order to attain a correspondingly enlarged cutting contact therewith. In Fig. 8, the abrasive tape 86′ is carried from its spool 73 over the idler roller 87′ and beneath the shoe 91 into an angularly wrapped relation with respect to the treated wire 37 as detailed in Fig. 12. The tape may then be threaded around the companion idler roller 88′ and interposed between said wire and the jaw roller 96, whereupon said tape is carried to the flanged driven feed roller 85. A tape clamping roller 97 may be pivotally mounted upon spring retained guide links 98 to obviate tape slippage about its feed roller. The advanced free end of the spring tape may be carried to a take-off spool (not shown) or severed from time to time after accumulation. When dismounting a disc from its guideways, a corresponding looped tape end may be loosened and withdrawn from the interposed wire.

The widely divergent disposition given to each of our tapes 86 and 86′ allows the braded material to freely drop or be blown away from their respective cutting zones. A pair of upstanding air injector nozzle tubes such as 99 may be erected upon the flange 92 and located between the respective divergent tape regions. Such injected fluid may be supplied through the nipple 100 that connects with the branch pipe 24 to promptly remove any abrasive material that may otherwise tend to lodge in such regions and also to partially cool the treated wire while being frictionally dragged.

Referring now to Fig. 17, this discloses a modified disc layout in which twin tapes are provided on each side face of the disc 101. Here companion spools 102 and 103 independently supply the abrasive tapes 104 and 105 as indicated by dotted and dashed lines. Disposed around the spool 102 are multiple upstanding guide rollers 106 to 109 which carry the tape in a circumferentially cleared loop about the last named spool and into operative engagement with its feed roller 110. Said feed roller may be mounted upon a fixed tubular stanchion identical with the corresponding element 79 of Fig. 9 and similarly equipped with a stub shaft that extends through

the disc 101 to drive the complementary feed roller gears 113 and 114 located upon the opposite disc face.

The feed roller 110 may cooperate with a spur gear 115 to mesh with a companion gear 116 that drives the mated feed roller 117 for the other tape 105 as shown. All of these gears may be simultaneously actuated in their arrowed directions by the flexible shafting 30'. The roller layouts on both disc sides are identical except that as indicated in dotted outline, the tape supply spools 102' and 103' on one side face may be angularly displaced by a certain lead angle A with respect to the corresponding full-lined spools on the other side face.

The underlying purpose of said multiple rollers 106—109 is to allow of centralizing the required roller gearing wholly to one side of the disc center-line C—D and thereby obviate having to spread apart the complementary feed rollers 110 and 117 into opposed disc regions. The bracket flange 118 is provided with an actuated bellows agency and with reversely pivoted backing shoes 120 and 121 as detailed in Fig. 18. The treated wire 37 is interposed between the tapes 104 and 105, the last named being preferably arranged to constitute a planiform cutting zone 122 and its mated tape 104 being divergently disposed. The shoe 120 may also be provided with a round edged flat zone 123 that lies in parallelism with the opposed zone 122 whereby to establish assured balanced tangential contact with the treated wire in reversed drag directions. The self-centering abrasive grip of said tapes represents a preferred embodiment in not being modified by a limited sag or the like lateral shift on part of the tensioned wire 37.

The disc 101 is again provided with a radial slot 124. In order to clear said slot for unobstructed disc removal, the idler roller 125 for the tape 105 is preferably retractibly mounted to swing out of the way about the pivot 126 into its dotted non-overlapping slot position. A set screw 127 locks said roller in operative position. If desired, such idler roller may also be non-retractibly mounted in its dotted position, in which event the corresponding tape backing shoe edge should be more bluntly rounded.

Such cleared slot affords an advantage in that when the slot 124 is directed downwardly into our housing, the disc 101 may be freely hoisted upwardly without entanglement with a work piece 37 when previously threaded through our housing, although all tapes on the removed disc remain engaged about their respective spools. Upon being completely reloaded, the respective tapes of said disc assembly unobtructedly straddle such work piece while the disc is being dropped into its guideways.

The mode of operation of the described instrumentalities is thought to be obvious. For one pass grinding operation on high tensile strip stock, it is preferred to resort to a pair of tandem housing units each comprising some 8 to 12 compartments such as 21A, 21B, etc. The first entered of such units may be charged with coarse grit tape. By a proper setting of the finger tip control 33, such tape may be advanced at a rate appropriate for a given stock size to obtain a comparatively fast abrasive action. The second unit may be supplied with finer tape or the same coarse grit tape may be independently set to advance such tape at a relatively slower rate to bring about a grit loading effect adapted to impart a brilliant longitudinally stroked finish to the treated product.

The large stock of tape provided is ample to last for days of continuous operation and sufficient to treat many tons of wire. When the tape supply needs to be replenished, spare multiple discs may with their completely assembled tapes, be quickly substituted for spent discs without unduly holding the machine out of commission. It will be observed from Fig. 6 that the compartmental span W is kept at a minimum so as to compactly install the maximum of tape width into a given overall housing length. In addition, the rate of tape feed which should be varied with the size and tensile strength of the treated wire, is placed under full control for each individual housing and may be altered at will while the wire is being abrasively treated.

The fact that the wire grip mechanism is pneumatically operated in clutch fashion and the respective tape clamping jaws may in a like manner be relieved, permits of easy motor starting, particularly in conjunction with the clutch lever 41. When working for a single pass performance, the accompanying gross tape drag may highly tension wire of small diametral size. The use of our individual grip mechanism for each housing unit stepwise relaxes the ultimate wire pull and hence allows of successively employing groups of wide tapes without exceeding a given allowable stress. This aspect is of special significance where mill run lengths are welded endwise to make up a sufficiently long wire to fill the drum of a large supply reel, as contemplated.

The foregoing disclosure will it is believed, make evident to those skilled in this art, the outstanding commercial advantages afforded by our novel improvements. It will be obvious that certain structural aspects of our housing discs and carried tape assemblies are likely to find application to purposes other than the superficial polishing or grinding of metallic strip stock and we reserve the right to correspondingly modify the illustrative disclosures, all without departing from the spirit and scope of our invention heretofore described and more particularly characterized in the appended claims.

We claim:

1. A grinder machine comprising a housing equipped with a pair of spaced guideway means, independent partition means demountably piloted by the respective guideway means, said partition means being each adapted to have a common elongated work piece entered therethrough, an abrasive element carried by each such partition means as a self-contained unit for bodily removal therewith, said elements being respectively brought into operative engagement with the work piece to constitute separate cutting zones therealong, means for feeding said elements toward their respective zones, and means for dragging the work piece longitudinally through the aforesaid cutting zones.

2. A grinder machine comprising a housing equipped with arcuate guideway means, a partition disc mounted to rotate manually in said guideway means and which disc is adapted to have an elongated work piece entered therethrough, an abrasive element carried on each side face of said disc, said elements being respectively brought into operative engagement with the work piece to constitute separate cutting zones therealong; drive means carried by said disc for simultaneously advancing the aforesaid elements toward the engaged work piece, releasable means

serving to retain said disc against unwanted rotation, and power actuated reel means for dragging the work piece longitudinally.

3. A compartmental grinder machine comprising an axially split tubular housing which is interiorly equipped with a series of arcuate guideways respectively disposed in spaced relationship lengthwise of the housing axis, a separate self-contained disc assembly for each such guideway with corresponding perimetric disc regions demountably inserted therein and which disc assemblies respectively carry a supply of abrasive tape of finite length, such successive discs each being adapted to have a common elongated work piece entered therethrough and the several tapes being brought into operative engagement with said work piece to establish angularly staggered cutting zones that are distributed to effectively embrace the entire work piece profile, feed roller means also constituting a complement of each such disc assembly and serving to advance their respective tapes onward toward the cutting zone thereof, and means for dragging the work piece longitudinally.

4. A complemental grinder machine comprising trough shell means including transverse partition means adapted to have a longitudinally movable work piece entered therethrough, an abrasive element carried by said partition means and which element is brought into operative engagement with the work piece, driven rotatable feed means upheld by said partition means and serving to advance the said element toward said work piece, driven line shaft means disposed lengthwise of said shell means and upheld exteriorly of the perimetric confines of the partition means, said line shaft means including an operatively connected stub spindle of which one end extends through the shell means, and a flexible shafting length mounted interiorly of said confines and serving to couple the extended spindle end with the driven feed means.

5. A compartmental grinder machine comprising a housing equipped with a pair of spaced arcuate guideways, separate partition disc means of which their respective perimetric regions are rotatably and independently piloted by the respective guideways, said disc means being each provided with an open ended radial slot adapted to have a common elongated work piece dragged through the inner slot end region and which several slots when rotated into registry serve to unobstructedly pass the work piece lengthwise of such slots, an abrasive element carried by each such disc means and which elements are brought into operative engagement with the dragged work piece, means advancing the several elements onward toward their respective cutting zones, and means for dragging the work piece longitudinally through the aforesaid inner slot end regions.

6. A surface grinding machine comprising a compartmental housing equipped with a series of laterally spaced partitions each adapted to have a common elongated work piece dragged therethrough, an abrasive element for each such partition and which elements are brought into operative engagement with the work piece, a supply reel and a take-up reel located in tandem with the housing and respectively cooperating with opposed end regions of the dragged work piece, and a power driven grip mechanism arranged to tightly clutch a treated rectilinear leading work piece portion and thereby drag an untreated trailing work piece portion through the several partition apertures, said mechanism being interposed between the housing and the take-up reel.

7. A surface grinding machine comprising a plurality of housings respectively adapted to have a common elongated work piece dragged therethrough, a series of abrasive elements for each such housing and which elements are brought into operative engagement with the work piece, a supply reel and a take-up reel respectively cooperating with opposed end regions of the dragged work piece, and a power driven grip mechanism applied to at least one such housing and arranged to tightly clutch a leading work piece portion for delivering the work piece to the take-up reel in a condition substantially relieved of drag tension.

8. In a surface grinder machine provided with abrasive elements, a grip mechanism including complementary pulley driven endless belts respectively comprising a spanning length component reversely arranged in superimposed flatwise adjacency to travel in a common direction at substantially the same linear velocity and adapted to have an elongated treated work piece tightly clamped lengthwise therebetween, a supply reel and a take-up reel disposed in tandem with said mechanism and respectively cooperating with opposed end regions of the dragged work piece, clutchable motive means for driving said complementary belts, and slippable clutch means tending to overdrive the take-up reel with respect to the aforesaid linear travel.

9. A surface grinder machine comprising a compartmental housing equipped with a series of laterally spaced partitions each adapted to have a common elongated work piece dragged therethrough, an abrasive element for each such partition and which elements are collectively brought into operative engagement with the work piece, a supply reel and a take-up reel located in tandem with the housing and respectively cooperating with opposed end regions of the dragged work piece, and a power driven grip mechanism provided with complementary endless belt means respectively comprising a spanning length component reversely arranged in superimposed flatwise adjacency to travel in a common direction and adapted to have said work piece interposed therebetween, said mechanism further including a series of successive backing rollers mounted behind the outermost face of each such spanning length component in opposed axial registry and which reversed counterpart roller series respectively serve to clamp said length components into gripping engagement toward the interposed work piece.

10. In a surface grinder machine, a grip mechanism including complementary pulley driven endless belts respectively comprising a spanning length component reversely arranged in superimposed flatwise adjacency and adapted to have an elongated work piece grippingly interposed therebetween, a separate clutchable backing roller retractibly mounted behind each such spanning length component in aligned axial registry with each other to grip said work piece, and fluid controlled means serving to actuate and set the grip of said backing rollers.

11. In a surface grinder machine provided with an abrasive element for treating an elongated work piece, a grip mechanism including complementary pulley driven endless belts respectively comprising a relatively wide spanning

length component reversely arranged in superimposed flatwise adjacency to travel in a common direction at substantially the same linear velocity, a grip strap affixedly circumscribing each such belt, said straps being kept narrower than the belt thereof and adapted to have the work piece tightly clamped lengthwise therebetween, and motive means for driving said complementary belts whereby to advance the work piece longitudinally.

12. A surface grinder machine comprising a compartmental housing equipped with laterally spaced partition plates respectively adapted to have a common elongated work piece entered therethrough, twin abrasive tape spools together with idler rolls and driven feed rollers respectively mounted upon a side of each partition to constitute a demountable unit, the tape from one such spool being initially brought into operative engagement with the work piece and thence carried circumferentially around the major portion of said one spool over certain idler rolls to a contiguous feed roller, and means for dragging the work piece longitudinally through the aforesaid partition plates.

13. A surface grinder machine comprising a compartmental housing equipped with an arcuate guideway, a partition disc mounted to rotate in said guideway, said disc being provided with an open ended radial slot adapted to have an elongated work piece entered through the inner slot end region, an abrasive tape carried on each side face of said disc, said tapes being respectively brought into operative engagement with the work piece in spaced edgewise relationship, driven feed roller means carried by said disc for simultaneously advancing the tapes onward toward the engaged work piece, an idler roll arranged to divert one of the advanced tapes from a rectilinear course, said roll being mounted to shift into alternative positions with respect to the disc slot, and power actuated means for dragging the work piece longitudinally.

14. A compartmental surface grinder machine comprising a longitudinally split tubular housing including a semicylindrical base component and a mated cover therefor, dual guideway means perimetrically disposed interiorly of and laterally interspaced along said housing component at a distance less than the cylindrical bore size, independently demountable partition discs whose perimeters are respectively piloted within said guideway means and serving to complete a housing compartment therebetween, said discs being respectively adapted to have a common elongated work piece entered therethrough, plural abrasive tapes carried upon each inner face of said discs for bodily removal with their respective discs, said tapes being collectively brought into operative contact with the work piece to constitute multifold regional cutting zones whose combined length measured longitudinally of the work piece is greater than the lateral spacing of said discs, actuated feed means carried by each such disc and serving to advance the tapes thereof toward their respective cutting zones, driven line shaft means disposed exteriorly lengthwise of said housing compartment, disconnective transmission means extending transversely inward through said tubular housing and when coupled serving to operatively interconnect the line shaft means with each of the several feed means, and means for dragging the work piece longitudinally through the aforesaid cutting zones.

15. A compartmental surface grinder machine comprising a longitudinally split tubular housing including a mounted base component and a mated cover therefor, a succession of interspaced guideway means arranged adjacent to the base perimeter, independently demountable partition means whose perimetric regions are respectively piloted by said guideway means, said partition means being respectively adapted to have a common elongated work piece threaded therethrough and each of which partition means individually have the following cooperative accessories, assembled thereon, namely: a pair of tape spools, an actuated feed roller for each tape, and a train of spur gears operatively interconnecting the feed rollers of each such disc, said partition assemblies being respectively driven by common line shaft means disposed exteriorly lengthwise of the enclosed housing and which line shaft means include disconnective transmission means extending transversely inward through said housing, the aforesaid transmission means when coupled respectively serving to operatively interconnect the several feed rollers to run in synchronism with the line shaft means and when uncoupled permitting any one partition means together with its accessories to be bodily demounted out of said base.

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