Aug. 29, 1944. A. G. NATZKE 2,356,783

MECHANISM FOR ROLLING WIRE

Filed Sept. 5, 1942 4 Sheets-Sheet 1

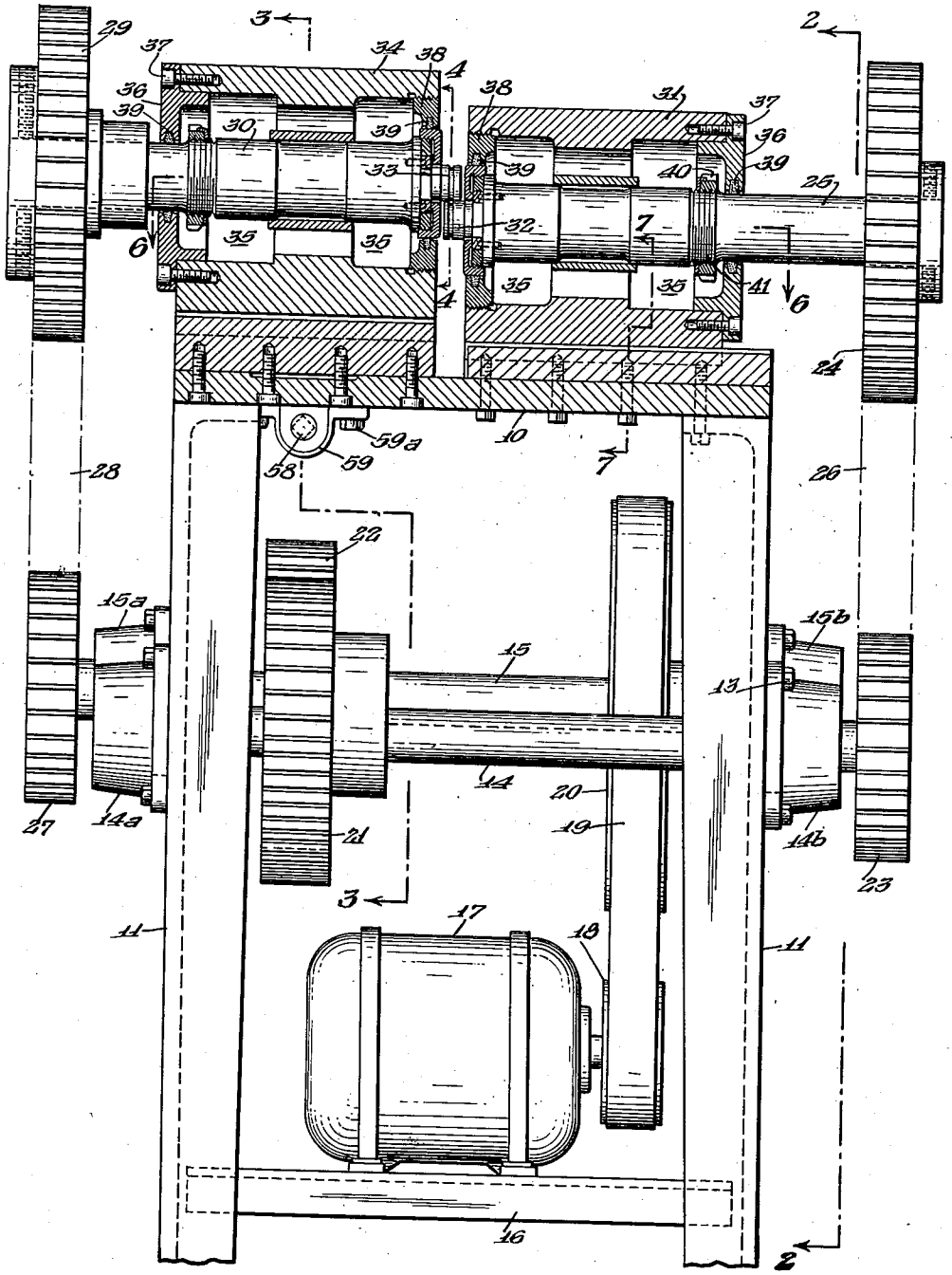


FIG. 1.

INVENTOR.

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Drew Thompson & Co ATTORNEY

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MECHANISM FOR ROLLING WIRE

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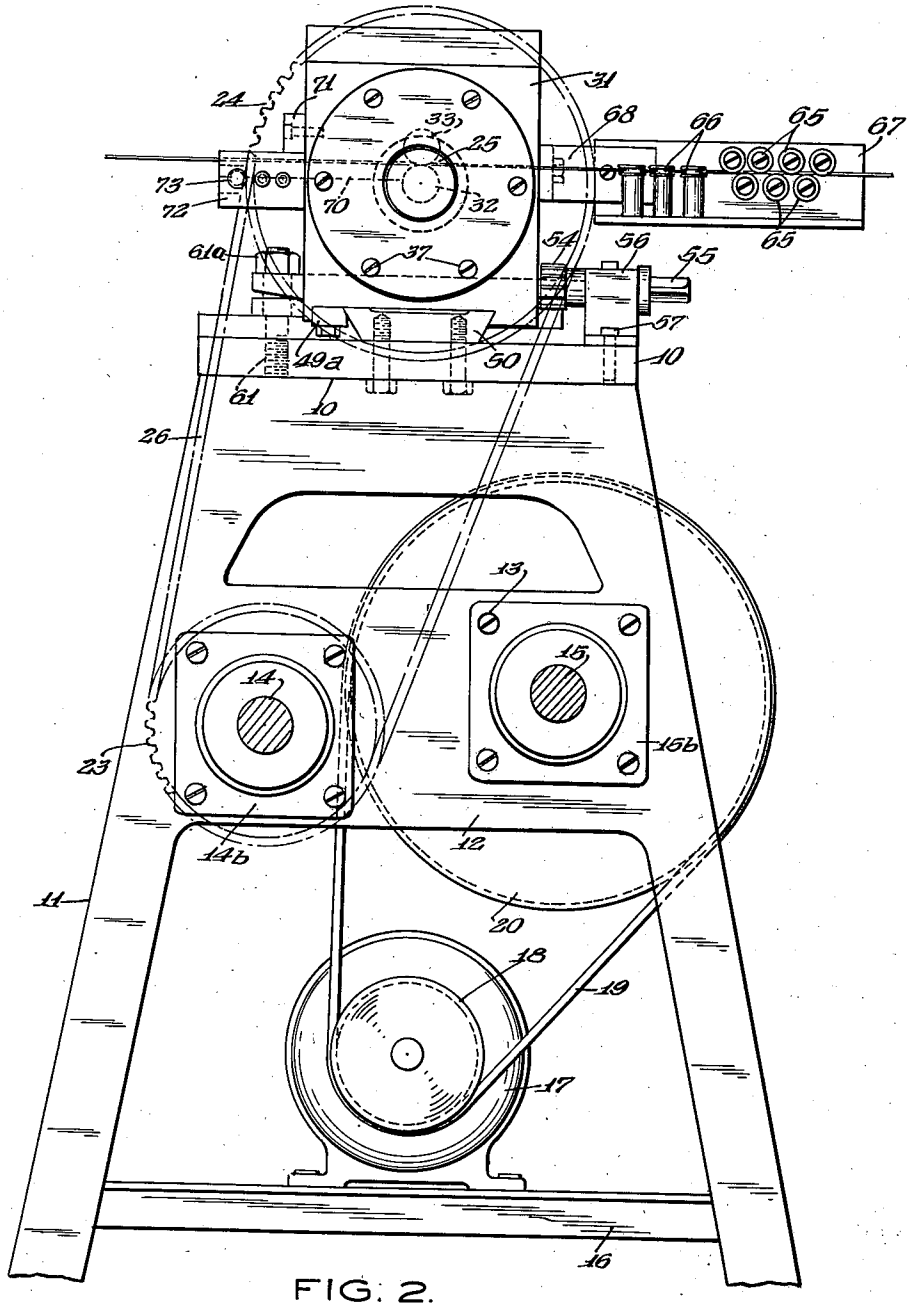


FIG. 2.

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MECHANISM FOR ROLLING WIRE

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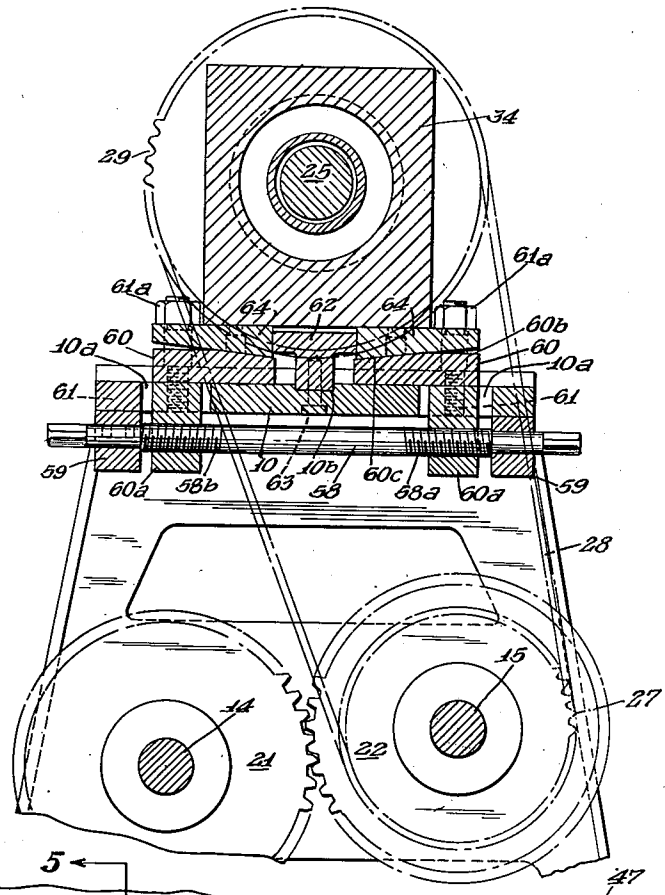


FIG. 3.

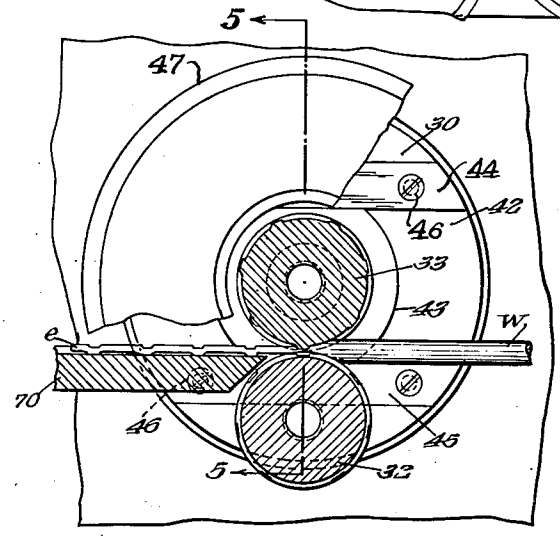


FIG. 4.

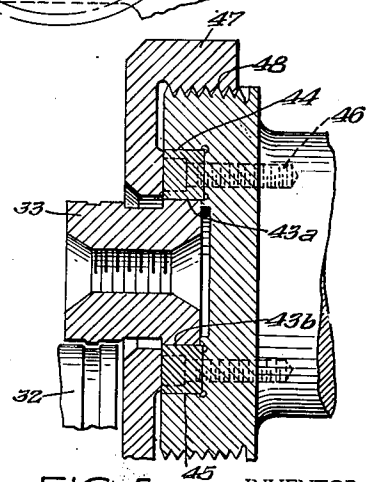


FIG. 5.

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MECHANISM FOR ROLLING WIRE

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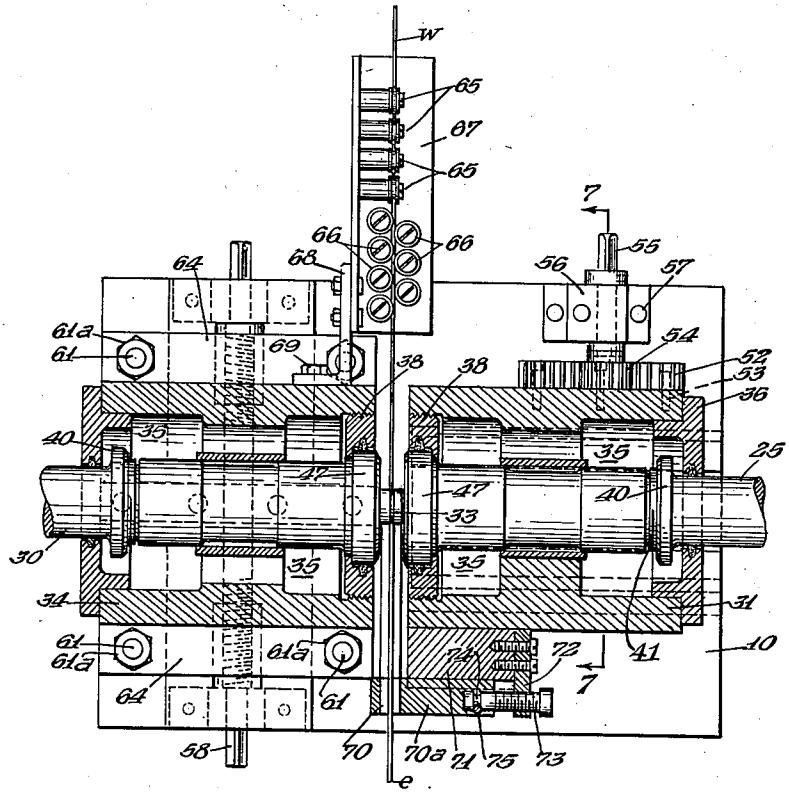


FIG. 6.

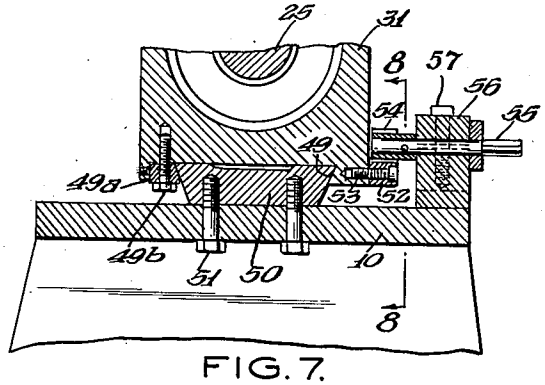


FIG. 7.

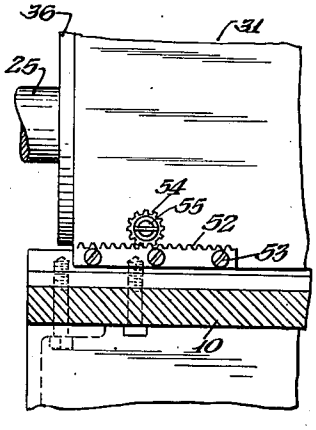


FIG. 8.

INVENTOR.

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Patented Aug. 29, 1944

2,356,783

UNITED STATES PATENT OFFICE

2,356,783

MECHANISM FOR ROLLING WIRE

Alfred G. Natzke, Lynbrook, N. Y., assignor to Lamar Slide Fastener Corp., New York, N. Y., a corporation of New York

Application September 5, 1942, Serial No. 457,477

16 Claims. (Cl. 80—24)

This invention relates generally to the manufacture of slide fasteners and is more particularly directed to a machine or mechanism for converting flexible wire or other suitable stock into continuous lengths of partially formed interlocking elements, the completion of the formation of the elements and their attachment to the usual tape in the production of the so-called stringers of the fastener, being accomplished in subsequent independent operations.

As is well known, various mechanisms are now available for stamping or forming the interlocking elements of slide fasteners in continuous lengths, for subsequent separation of the preformed units therefrom. All of these mechanisms, however, are of a more or less complicated design, with resulting high costs not only in initial equipment, but in operation and maintenance. This is especially true in those types of machines in which the interlocking elements are initially shaped or pre-formed in the passage of wire or other material between coacting pressure rollers, which it is recognized is the most practical method of pre-forming the elements, the means now employed in assembling the rollers in the mechanism and setting them for cooperative functioning entailing a series of time-consuming operations and adjustments, during which period, of course, the machines are non-productive.

The primary object of this invention, therefore, is to provide for greater economy in the production of the interlocking elements of slide fasteners, by utilizing mechanism of a simple and highly efficient design for partially forming the elements from wire or other appropriate material, as in standard practice; the mechanism being so constituted that the forming dies may be readily installed and the mechanism quickly adjusted for their conjoint functioning, with a minimum loss of production time, thereby greatly increasing the potential daily output of a machine conforming to my invention, as compared to those now in use.

More specifically, the principal object of this invention is to provide a mechanism for operating on wire to produce therefrom a series of connected and partially formed interlocking elements for slide fasteners, of a compact and simple design, in which necessary adjustments of the machine parts for functioning in production of the elements, may be readily effected without the use of special tools, the adjustment of my mechanism for aligning the dies being speedily accomplished by manually operable devices.

It is also an important object of this invention to provide a mechanism for partially forming interlocking elements for slide fasteners, possessing the aforesaid characteristics and advantages, which embodies a pair of dies in the form of coacting pressure rollers, between which the wire passes for deformation, in the production of the partially shaped elements, the dies being of small diameter and appreciably shorter than those now in use, so that less material is required in their production, with a consequent saving in the cost of their manufacture.

Another object of my invention is the simplification of the means for locking the dies in coacting position in the machine, the means that I employ for the purpose insuring a rigid and virtually integral connection of the dies to their rotating supports, so that the possibility of slippage of the dies under load, as may occur in the use of the present types of pressure roller dies embodying the conventional tapered bearing ends, is positively eliminated. This obviates production losses because of imperfections in the formation of the interlocking elements, which flow from slippage, and insures a degree of uniformity in the profiling of the elements that has not been attainable heretofore.

It is also an important object of this invention, to provide a mechanism utilizing coacting rotating dies, in the preforming of interlocking elements for slide fasteners, as aforesaid, in which the adjustment of the die-supporting means of the assembly, for effecting alignment of the cooperating active portions of the dies, may be most expeditiously performed, without possible detriment to accuracy and efficiency in operation.

Briefly, my invention contemplates a machine for partially forming interlocking elements of slide fasteners, in which flexible wire or other suitable material, as round stock is fed between a pair of coacting dies of the pressure roller type, mounted in superposed relation, in rigid engagement with rotatable spindles disposed on either side of the path of travel of the wire through the machine, in the processing thereof, the aligned active surfaces of the dies concurrently functioning to deform the wire passing therebetween and convert it into a connected series of partially profiled interlocking elements of uniform characteristics, it being manifest that in the passage of the wire between the dies, elongation and flattening result under the applied pressure, so that the length of a preformed series of connected elements will be greater than the

original length of the wire from which they are produced.

The dies are of small diameter, which has been found to be most efficient in the use of pressure rollers and instead of embodying a long tapering end for entry in the chucks of the respective supporting spindles, as at present, each die is cylindrical, except for a flange at its attaching end, which is formed for positive engagement with cooperating complemental surfaces on the die-supporting spindle, the die, when locked in position, thus becoming virtually an integral axial continuation of the spindle to which it is attached.

Means are also incorporated in my machine for facilitating the adjustment of the die-supporting means of the assembly, so that the dies may be readily installed and accurately aligned for conjoint functioning in the wire processing operation, by simple hand-effected horizontal and vertical movements of the die-supported means, as by the manipulation of so-called hand-wheels or cranks.

Other objects and advantages flowing from the practicing of my invention will become apparent as the description proceeds.

For the purposes of this disclosure, I have elected to show a preferred embodiment of my invention in the accompanying drawings, in which I employ dies of the pressure-roller type designed for processing flexible round wire, in producing the partially formed interlocking fastener elements. However, dies for operating on flat stock may be substituted therefor, with similar operational advantages, and various other changes in the structure of my mechanism may be made in carrying my invention into effect, without departing from the spirit and scope thereof, as will become manifest from the detailed description.

In the drawings:

Figure 1 is a side elevation, partly in section, of a preferred embodiment of my invention.

Figure 2 is an end elevation, on the line 2—2 of Figure 1.

Figure 3 is a view in elevation, partly in section, on the line 3—3 of Figure 1.

Figure 4 is a sectional elevation of the dies and material guide, taken on the line 4—4 of Figure 1.

Figure 5 is a transverse section on the line 5—5 of Figure 4.

Figure 6 is a horizontal cross section of the actuating mechanism, taken on the line 6—6 of Figure 1.

Figure 7 is a vertical sectional view on the line 7—7 of Figure 1; and

Figure 8 is an elevational view on the line 8—8 of Figure 7.

Referring now to the drawings in detail, in which like characters of reference are employed to designate similar parts in the several views, the machine as herein shown includes a bed 10 supported by the standards 11, connected at the ends of the machine by the cross members 12, to which are fixed, as by bolts 13, suitable bearings 14a, 14b and 15a, 15b for the shafts 14 and 15 respectively, which, as will be seen from Figure 1, are disposed longitudinally of the machine frame, in staggered or offset relation, the axis of the shaft 15 being above that of the shaft 14.

A base-forming member 16, embodied in the frame of the machine, below the shafts 14 and 15, functions as a support for the electric motor 17, the armature shaft of which carries a pulley 18. The shaft 15 is driven directly from said motor 17, through the medium of a belt of the link chain or other suitable type, indicated at 19, which traverses the motor pulley 18 and a pulley 20 keyed to said shaft 15, the shaft 14, in turn, being driven from the shaft 15, through the meshing gears 21 and 22 fixed to the respective shafts, as clearly shown in Figure 3. The gears 21 and 22 are of the same diameter, so that the shaft 14 will revolve at the same rate of speed as the motor-driven shaft 15.

At one end of the machine frame, the shaft 14 protrudes beyond its bearing 14b and carries a gear wheel 23 connected to a gear wheel 24 mounted on the spindle 25 by a link chain belt 26. Similarly, the shaft 15 projects beyond its bearing 15a, at the opposite end of the machine frame, a gear 27 being mounted thereon to be traversed by a link chain belt 28 in engagement with the gear 29 keyed to the spindle 30.

The gears 24 and 29 are of corresponding diameter and larger than the respective gears 23 and 27, so that the spindles 25 and 30 revolve at a lower rate of speed than the shafts 14 and 15, from which they are driven. Any desired speed differential may be obtained, as will be obvious, by utilizing gears of other diameters on the driving shafts or on the spindles 25 and 30.

The spindles 25 and 30 are journaled in suitable roller bearings 35, in the respective bearing blocks 31 and 34, each spindle functioning as a support for a die in the nature of a pressure-forming roller, the female die 32, in the present showing, being mounted on the spindle 25, while the male die 33 is rotatable with the spindle 30, in superimposed relation to the die 32, the two dies coacting to deform the wire as it passes between them, in producing the partially shaped interlocking elements, as hereinafter described.

Each of the bearing blocks 31 and 34 is provided with a cap plate 36, fixed to the outer end thereof, as by screws 37, through which the spindle mounted in the block projects. An annulus 38 is threaded into the inner end of each block, the inner end of the spindle and the die-engaging means carried thereby, rotating within the annulus, as will become evident, the cap 36 and said annulus being provided with suitable packing material, as the rings 39, seated therein. Necessary axial or longitudinal adjustment of the spindle in lining up the latter relative to the bearings 35, for insuring accurate registration of the active surfaces of the cooperating dies or pressure rollers 32 and 33, is effected by means of the collar 40 in threaded engagement with the spindle, as at 41.

As will be noted from Figure 1, the axis of the spindle 30 carrying the male die 33 is in vertically spaced relation to the axis of the oppositely mounted spindle 25, to locate the die 33 above the female die 32 carried by the latter spindle, as previously pointed out. Since both dies or pressure rollers are similarly connected to the respective spindles 25 and 30, the description of the means for mounting the male die 33 on the inner end of the spindle 30 and locking it thereto will suffice for the purposes of this description.

As will be observed, especially on reference to Figures 4 and 5, the inner end of the spindle 30 is undercut or centrally recessed, as at 42, a die seat within the area of the recess being defined by the base of the recess and the bars 44 and 45 disposed in parallel transversely thereof and bolted to the spindle, as at 46, the ends of these bars, preferably, being conformed to the shape

of the portions of the inner wall of the recess upon which they abut, as shown in Figure 4.

The die or pressure roller 33 embodies a flange 43 at one end disposed at a right angle to the body of the die, portions of this flange being cut away to provide parallel flat surfaces, as indicated at 43a and 43b, which are adapted to be entered between the opposed complemental surfaces of the aforesaid bars 44 and 45, in locating the die on said spindle 30. Preferably, the bars or members 44 and 45 are of approximately the same depth as the flange 43 of the die and are relatively laterally spaced to provide just sufficient tolerance for the entry of the flange surfaces 43a and 43b therebetween in frictional engagement therewith, with the base of the die flange abutting upon the base of the recess 42. As will be manifest, with the flattened surfaces 43a and 43b of the die engaged between the bars 44 and 45, as described, the die will project outwardly of the end of the spindle and will rotate therewith in the manner of an integral axial extension, the die being axially aligned with the spindle and locked against displacement from its seated position within the recess 42 by a retaining ring 47. This retaining ring embraces the die and is formed to abut upon the flange 43 thereof, the seating of the retaining ring in threaded engagement with the spindle, as indicated at 48, urging the base of the flange 43 of the die into close association with the base of the spindle recess 42 and producing a clamping action which eliminates any possibility of endwise movement of the die, while, as pointed out, the engagement of the flattened portions of the die flange with the transverse members 44 and 45 within the spindle recess 42 insures a maximum of efficiency in the operation of the die.

To provide for positioning the respective dies 32 and 33 upon their supporting spindles 25 and 30 as just described, and to facilitate accurate alignment of the active surfaces of the dies for functioning as the wire is fed therebetween in the operation of the machine, the bearing block 31 is slidable longitudinally of the bed 10, in a plane parallel to the shafts 14 and 15, while the opposite bearing block 34 is supported from the bed for adjustment in a vertical plane.

Preferably, as herein shown, the base of the bearing block 34 is provided with a V slot 49 in engagement with a V guide 50 disposed longitudinally of the machine bed 10 and bolted thereto, as at 51, the slot or slide 49 embodying a strip 49a, bolted to the base of the bearing block, as at 49b, the strip 49a being laterally adjustable to compensate for wear in the engaged surfaces of the assembly.

A rack 52 is rigidly secured to one face or side of the bearing block 31 adjacent the bottom edge thereof, as by the countersunk screws 53, a pinion 54 keyed or otherwise fixed to the shaft 55 rotatable in the bearing member 56 bolted to the bed 10, as at 57, being in mesh with said rack 52. The outer end of the shaft 55 is preferably squared to receive a hand wheel or crank (not shown), whereby the shaft may be rotated clockwise or anticlockwise, to actuate or move the bearing block 31 longitudinally of the bed 10, in counter directions, relative to the opposite bearing block 34.

The vertical adjustment of the bearing block 34 is effected by the rotation of the screw 58, by means of a hand wheel or crank (not shown) attachable to one or the other of the squared ends thereof, this screw being mounted transversely of the machine bed 10 in suitable bearings 59 bolted to the underside thereof, as at 59a, the right and left threaded portions 58a and 58b of the screw being engaged with complemental threads formed in the arms 60a depending from the slides 60 intermediate of the ends thereof.

The slides 60 are relatively oppositely movable in bearing engagement with and transversely of the bed 10, between the opposite pairs of studs 61 seated in said bed, in response to the actuation of the screw 58, within the limits defined by the slots 10a provided in the bed 10, through which the arms 60a of the slides 60 depend, a centrally located groove 10b being formed in the bed for the reception of the base portion of a T block 62 disposed parallel to the longitudinal axis of the bearing block 34 and bolted to the bed 10, as at 63, the head of said T block 62 being entered between the longitudinal laterally spaced ways 64, fixed to the base of the bearing block which extend outwardly of the sides thereof and are apertured for the projection of the studs 61 therethrough to receive the securing nuts 61a. As will be observed, the undersurface of each of the ways 64 is inclined downwardly from its outer side to its inner face, the T block 62 in engagement with the inner faces of the ways serving to maintain the bearing block 34 centered upon the longitudinal axis of the bed, as the slides 60 are actuated to raise or lower the bearing block, the ways traversing the opposed vertical faces of the T block in their vertical movement with the bearing block.

Vertical movement of the bearing block 34 occurs in response to the concurrent inward or outward movement of the two slides 60, transversely of the bed 10, as a result of the inclined formation of the top surfaces of the slides upon which the ways 64 abut. The top surface of each slide 60 is inclined downwardly from a flat outer marginal portion 60b toward the inner vertical face of the unit, as indicated at 60c, the inward movement of the two slides with the inclined surfaces of the ways in mating engagement therewith, as will be obvious, elevating the bearing block 34, while the actuation of the slides in the reverse direction will effect the lowering of the bearing block, sufficient clearance being provided between the top of the T block 62 and the base of the bearing block 34 to increase the range of downward adjustment of the latter beyond that which is normally required.

To mount the respective dies 32 and 33 upon their supporting spindles 25 and 30, the bearing block 31 is actuated outwardly (to the right, viewing Figure 1) along the bed, in the manner described, to a position in appropriately spaced relation to the opposite bearing block 34, to afford free access to the inner ends of the spindles for locating the dies in the seats formed by the recesses 42 and the cooperating members 44 and 45 and threading the retaining rings 47 upon the spindle ends to secure the dies in seated position.

The securing nuts 61a are then turned along the studs 61 out of engagement with the top surfaces of the ways 64, upon which they normally abut to retain the bearing block 34 immovable relatively to the bed 10, whereupon the bearing block 34 may be slightly elevated, if necessary, by the actuation of the screw 58 as heretofore explained, to permit the male die 33 to clear the periphery of the female die 32, as the bearing block 31 is urged longitudinally of the bed, toward the bearing block 34 in response

to the actuation of the pinion 54, until the active surface of the female die is accurately aligned with the cooperating surface of the male die 33 supported in superposed relation thereto, on the spindle 30. When the active surfaces of the two dies are in alignment or registration, the bearing block 34 is then lowered by the manipulation of the screw 58 in the reverse direction, to actuate the slides 60 outwardly, until the correct tolerance between the active surfaces of the two dies is obtained for processing the wire stock which may be introduced to the machine for conversion into the partially formed interlocking elements, the bearing block 34 being then anchored to the bed 10 by turning the nuts 61a down on the studs 61 into engagement with the ways 64. Obviously, the vertical adjustment of the bearing block 34 provides for the operation of the machine with wire of different gauges and dies of lesser or greater diameter than conventionally employed, if desired.

Following the setting of the dies, the wire to be processed, indicated at *w*, is drawn from a spool or other carrier, and introduced between two sets of friction guide rollers, the rollers of one set, indicated at 65, rotating in a vertical plane, while those of the second set, indicated at 66, rotate in a horizontal plane, the two sets of rollers being respectively mounted upon the flange and web of an angle plate 67 supported by a bracket 68, bolted to the side of the bearing block 34, as at 69. The plate 67, as will be seen from Figure 6, extends outwardly of one side of the machine, the effective surfaces of the friction rollers of both sets being approximately in alignment with the active surfaces of the dies 32 and 33, the cooperating rollers functioning to align the wire for passage between the dies and maintain it under sufficient tension to eliminate buckling or kinking. As the wire enters between the revolving dies, it is deformed in response to the counter pressure effective thereon to produce the partially profiled interlocking elements, the converted wire, indicated at *e*, issuing from between the dies to enter the trough or guideway 70 located between the bearing blocks 31 and 34, with its inner end in juxtaposition to the dies, and supported from the side of the bearing block 31 by a suitable bracket or fitting 71, including a plate 72 bored and tapped for the reception of an adjusting screw 73. This screw 73 is provided with a peripheral groove 74 adjacent the inner end of its shank in engagement with a pin 75 on the lateral extension 70a of said guideway, the screw being actuatable for effecting lateral adjustment of the trough for its axial alignment with the active surfaces of the pressure rollers or dies 32 and 33. (See Figures 2 and 6.) As the converted wire exits from the trough 70 in the shape of a series of connected partially formed interlocking elements, it may be wound upon a suitable carrier or otherwise stowed for the performance of the subsequent operations that are followed in completing the formation of the elements and attaching them to lengths of tape to produce the usual stringers of the slide fastener assemblies.

While I have described my invention more or less specifically, as herein shown, various changes in the details and arrangement of structure may be effected to meet production and operational requirements, as will be evident, within the scope of this disclosure. For example, in lieu of the spindle seat-engaging ends of the dies being formed as set forth, the seat-engaging surfaces upon the dies may be provided by undercutting the periphery of the inner end of the die to abut upon the transverse members within the recess of the spindle in which the die is to be mounted. Thus dies of larger diameter may be employed, with retaining rings of the appropriate internal diameter in association therewith for locking the dies to the spindles. Also, in lieu of the transverse members 44 and 45 bolted to the base of the spindle recess 42, shoulders may be formed integral with the spindle end for functioning in the manner described in providing a seat for the die.

From the foregoing description of my invention, it will be manifest that I have devised a simple and efficient mechanism for attaining the objectives to which my invention is directed, as hereinbefore set forth.

I claim:

1. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a pair of oppositely supported horizontally disposed spindles, the axis of one of said spindles being vertically offset relative to the axis of the other spindle, each spindle embodying a seat formed for engagement by a die, whereby the active surface of the die will be located outwardly of said seat, means connectable to the spindle for locking a die in positive engagement with said seat, means for effecting longitudinal adjustment of one of said spindles toward and from the opposite spindle through a distance equal at least to the clearance required for positioning the dies upon their respective spindles in positive engagement with said seats and means for effecting vertical movement of the second spindle relative to the first spindle for locating a die carried thereby in cooperating superposed relation to a die carried by the first spindle.

2. A mechanism for producing a series of preformed connected interlocking elements for slide fasteners from a continuous wire, including a bed, a pair of spindles, means for supporting said spindles for rotative movement in a horizontal plane, the axis of one of said spindles being vertically offset relative to the axis of the other spindle, each of said spindles embodying a seat formed for engagement by a die, whereby the active surface of the die will be located outwardly of the adjacent end of the spindle, means in threaded engagement with the end of the spindle for securing the die in engagement with said seat, rotatable means for actuating the supporting means of one of said spindles relative to said bed in a horizontal plane toward and from the supporting means of the other spindle through a distance equal at least to the longitudinal dimension of said dies, and means including rotatable and reciprocable devices for vertically moving the supporting means for the second spindle relative to said bed, the relative adjustment of said two supporting means being effective to dispose dies carried by the respective spindles in superposed relation between said supporting means, with their active surfaces in cooperating registration.

3. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks oppositely positioned on said bed, each of said blocks functioning as a sup-

port for a spindle adapted to receive a die to be connected thereto for conjoint rotative movement, means for distancing one of said bearing blocks from the opposite bearing block with a single translatory movement thereof in a horizontal plane relative to said bed by an amount sufficient for positioning the dies upon their respective spindles and for removing the same therefrom, and means for raising and lowering the second bearing block.

4. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks oppositely positioned on said bed, each of said bearing blocks functioning as a support for a horizontally disposed spindle adapted to receive a die for connection thereto for conjoint rotative movement, one of said spindles having its axis in a plane above the axis of the opposite spindle, whereby the dies when connected to the respective spindles will be in superposed relation, means for moving one of said bearing blocks relative to said bed in a horizontal plane toward and from the opposite bearing block through a distance equal at least to the clearance required for positioning the dies upon their respective spindles, and for removing said dies therefrom, and means for vertically moving the second bearing block relative to said bed, said latter means including rotatable and slidable devices mounted for movement in parallel horizontal planes.

5. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks positioned on said bed, each of said bearing blocks functioning as a support for a spindle mounted therein for rotation in a horizontal plane, the plane of the axis of one of said spindles being above that of the axis of the opposite spindle, a pair of pressure roller dies, means for connecting the dies to the opposed ends of the respective spindles for rotation therewith, whereby each die will form a coaxial extension of its supporting spindle, means actuatable for moving one of said bearing blocks in a horizontal plane relative to said bed away from the opposite bearing block through a distance at least equal to the clearance required for positioning the dies upon their respective spindles and toward said opposite bearing block to locate the die supported from the spindle thereof beneath the die supported from the opposed spindle in vertical alinement therewith and means for effecting vertical movement of the second bearing block relative to said bed, operable in one direction to lower said second bearing block to adjust the die supported from the spindle of the latter bearing block in predetermined superposed functioning relationship to the first die for the coaction of the effective surfaces of the dies in the operation of said mechanism.

6. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks positioned on said bed, each of said bearing blocks functioning as a support for a spindle mounted therein for rotation in a horizontal plane, the plane of the axis of one of said spindles being above that of the axis of the opposite spindle, a pair of pressure roller dies, means for connecting the dies to the opposed ends of the respective spindles for rotation therewith, whereby each die will form a coaxial extension of its supporting spindle, said means including a die-receiving seat formed on the inner end of each spindle and a device adjustable relative to the die and spindle for retaining the die immovable relative to the spindle seat in which it is entered, coacting means external of said bed and of one of the bearing blocks actuatable for moving said bearing block in a horizontal plane relative to said bed away from the opposite bearing block through a distance equal at least to the clearance required for positioning the dies upon their respective spindles and toward said opposite bearing block to locate the die supported from the spindle thereof beneath the die supported from the opposed spindle in vertical alinement therewith, and means for effecting vertical movement of the second bearing block relative to said bed, operable in one direction to lower said second bearing block to adjust the die supported from the spindle of the latter bearing block in predetermined superposed functioning relationship to the first die for the coaction of the effective surfaces of the dies in the operation of said mechanism.

7. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks positioned on said bed, each of said bearing blocks functioning as a support for a spindle mounted therein for rotation in a horizontal plane, the plane of the axis of one of said spindles being above that of the axis of the opposite spindle, a pair of pressure roller dies, means for connecting the dies to the opposed ends of the respective spindles for rotation therewith, whereby each die will form a coaxial extension of its supporting spindle, said means including a die-receiving seat formed by surfaces projecting from the end of the spindle relatively disposed for engagement with complemental peripheral portions of the die, when the opposed ends of the die and spindle are in abutting engagement and a retaining ring in threaded engagement with the spindle and embracing the die in engagement therewith to render the die immovable relative to the spindle, means actuatable for moving one of said bearing blocks in a horizontal plane relative to said bed toward the opposite bearing block to locate the die supported from the spindle thereof beneath the die supported from the opposed spindle in vertical alinement therewith and means for effecting vertical movement of the second bearing block relative to said bed, operable in one direction to lower said second bearing block to adjust the die supported from the spindle of the latter bearing block in predetermined superposed functioning relationship to the first die for the coaction of the effective surfaces of the dies in the operation of said mechanism.

8. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks positioned on said bed, each of said bearing blocks functioning as a support for a spindle mounted therein for rotation in a horizontal plane, the plane of the axis of one of said spindles being above that of the axis of the opposite spindle, a pair of pressure roller dies, means for connecting the dies to the

opposed ends of the respective spindles for rotation therewith, whereby each die will form a coaxial extension of its supporting spindle, means actuatable for moving one of said bearing blocks in a horizontal plane relative to said bed away from the opposite bearing block through a distance equal at least to the clearance required for positioning the dies upon their respective spindles and toward said opposite bearing block to locate the die supported from the spindle thereof beneath the die supported from the opposed spindle in vertical alinement therewith, means slidably mounted between the second bearing block and said bed and rotatable means for actuating said slidably mounted means for effecting vertical movement of said second bearing block relative to said bed, whereby the die supported from the spindle of the latter bearing block may be adjusted in a vertical plane in superposed relation to the die carried by the spindle supported by the first bearing block.

9. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks positioned on said bed, each of said bearing blocks functioning as a support for a spindle mounted therein for rotation in a horizontal plane, the plane of the axis of one of said spindles being above that of the axis of the opposite spindle, a pair of pressure roller dies, means for connecting the dies to the opposed ends of the respective spindles for rotation therewith, whereby each die will form a coaxial extension of its supporting spindle, means actuatable for moving one of said bearing blocks in a horizontal plane relative to said bed away from the opposite bearing block through a distance equal at least to the clearance required for positioning the dies upon the opposed ends of their respective spindles and toward said opposite bearing block to locate the die supported from the spindle thereof beneath the die supported from the opposed spindle in vertical alinement, means mounted between the second bearing block and said bed for opposite slidable movement and rotatable means for conjointly actuating said slidable means for vertically moving said second bearing block relative to said bed, whereby the die supported from the spindle mounted on the latter bearing block may be adjusted in vertical alinement with the die carried by the oppositely supported spindle.

10. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks positioned on said bed, each of said bearing blocks functioning as a support for a spindle mounted therein for rotation in a horizontal plane, the plane of the axis of one of said spindles being above that of the axis of the opposite spindle, a pair of pressure roller dies, means for connecting the dies to the opposed ends of the respective spindles for rotation therewith, whereby each die will form a coaxial extension of its supporting spindle, means fixed to said bed externally thereof coacting with means rigid with one of said bearing blocks to render the latter bearing block horizontally reciprocable relative to said bed with a stroke equal at least to the clearance required for positioning the dies upon the opposed ends of their respective spindles and for removing said dies therefrom, rotatable means actuatable to move said bearing block relative to said bed, a predetermined movement of said rotatable means in one direction producing a concurrent movement of the bearing block toward the opposite bearing block to locate the die supported from the spindle thereof in vertical alinement with the die projecting from the spindle of said opposite bearing block, means mounted between the second bearing block and said bed for opposite slidable movement and rotatable means for conjointly actuating said slidable means for vertically moving said second bearing block relative to said bed, for adjusting the die supported from the spindle of said second bearing block in vertical alinement with the die carried by the oppositely supported spindle.

11. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks positioned on said bed, each of said bearing blocks functioning as a support for a spindle mounted therein for rotation in a horizontal plane, the plane of the axis of one of said spindles being above that of the axis of the opposite spindle, a pair of pressure roller dies, means for connecting the dies to the opposed ends of the respective spindles for rotation therewith, whereby each die will form a coaxial extension of its supporting spindle, means fixed to said bed externally thereof coacting with means rigid with one of said bearing blocks to render said latter bearing block horizontally reciprocable relative to said bed with a stroke equal at least to the clearance required for positioning the dies upon the opposed ends of their respective spindles and for removing said dies therefrom, rotatable means actuatable to move said bearing block horizontally of said bed, a predetermined movement of said block in one direction locating the die supported from the spindle of said latter bearing block in vertical alinement with the die carried by the oppositely supported spindle, means slidably mounted between the second bearing block and said bed and rotatable means for actuating said slidably mounted means for effecting vertical movement of said second bearing block relative to said bed, for adjusting the die supported from the spindle of the latter bearing block in a vertical plane in superposed relation to the die carried by the spindle supported by the first bearing block.

12. A pressure roller or die for deforming wire in a step in the production of interlockable elements for slide fasteners, comprising a cylindrical body portion having surfaces formed on the periphery thereof, adjacent one end, to deformably engage the wire, the opposite end of said body portion embodying an annular flange projecting outwardly of said body portion, diametrically opposite portions of said flange being cut away to provide parallel flat surfaces adapted for engagement with complemental surfaces disposed transversely of a spindle upon which said pressure roller is mountable for operation.

13. A pressure roller or die for deforming wire in a step in the production of interlockable elements for slide fasteners, comprising a cylindrical body portion having surfaces formed on the periphery thereof, adjacent one end, to deformably engage the wire, the opposite end of said body portion embodying a flange disposed at a right angle outwardly of the periphery of the body portion, the peripheral contour of said flange being defined by curved and flat surfaces, the flat surfaces being parallel and oppositely

disposed relative to the axis of the body portion, said flange being adapted to coact with seat-forming surfaces on a spindle for the connection of the die to such spindle for rotative movement therewith.

14. A pressure roller or die for deforming wire in a step in the production of interlockable elements for slide fasteners, comprising a cylindrical body portion having surfaces formed on the periphery thereof, adjacent one end, to deformably engage the wire, the opposite end of said body portion embodying an outwardly projecting flange disposed at a right angle to the axis of the body portion, the peripheral contour of said flange being defined by arcuate surfaces in alternation with surfaces of a different order, the latter surfaces being oppositely disposed relative to the axis of the body portion and adapted for engagement with complemental end surfaces of a spindle to support the die in co-axial alinement with such spindle for rotative movement therewith, in the functioning of the die.

15. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks positioned on said bed, each of said bearing blocks functioning as a support for a spindle mounted therein for rotation in a horizontal plane, the plane of the axis of one of said spindles being above that of the axis of the opposite spindle, a pair of pressure roller dies, means for connecting the dies to the opposed ends of the respective spindles for rotation therewith, whereby each die will form a coaxial extension of its supporting spindle, said means including a die-receiving seat formed by surfaces projecting from the end of the spindle relatively disposed for engagement with complemental peripheral portions of the die, when the opposed ends of the die and spindle are in abutting engagement and a retaining ring in threaded engagement with the spindle and embracing the die in frictional engagement therewith to render the die immovable relative to the spindle, means fixed to said bed coacting with means rigid with one of said bearing blocks to provide for horizontal reciprocation of said bearing block relative to said bed, rotatable means for actuating said bearing block relative to said bed, a predetermined movement of said block toward the opposite bearing block locating the die supported from the spindle thereof in vertical alinement with the die projecting from the spindle of such opposite block, means mounted between the second bearing block and said bed for opposite slidable movement and rotatable means for concurrently actuating said slidable means for effecting vertical movement of said second bearing block relative to said bed, whereby the die supported from the spindle of the latter bearing block may be adjusted in vertical alinement with the die carried by the spindle supported in the horizontally movable bearing block.

16. A mechanism for processing wire or other flexible metal stock for producing a connected series of partially formed interlockable slide fastener elements therefrom, including a bed, a pair of bearing blocks oppositely positioned on said bed, each of said bearing blocks functioning as a support for a horizontally disposed spindle adapted to receive a die for connection thereto for conjoint rotative movement, one of said spindles having its axis in a plane above the axis of the opposite spindle, whereby the dies when connected to the respective spindles will be in superposed relation, means fixed to said bed externally thereof coacting with means rigid with one of said bearing blocks to provide for horizontal reciprocation of said bearing block relative to said bed through a distance equal at least to the clearance required for connecting the dies to their respective spindles, rotatable means for actuating said bearing block relative to said bed, a predetermined movement of said block toward the opposite bearing block locating the die supported from the spindle thereof in vertical alinement with the die projecting from the spindle of such opposite block, means mounted between the second bearing block and said bed for opposite slidable movement and rotatable means for concurrently actuating said slidable means for vertically moving said second bearing block relative to said bed, whereby the die supported from the spindle of the latter bearing block may be adjusted in vertical alinment with the die carried by the spindle supported in the horizontally movable bearing block.

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