

April 17, 1962

J. STEYH
TRAVERSING MECHANISM

3,029,649

Filed Dec. 15, 1959

4 Sheets-Sheet 1

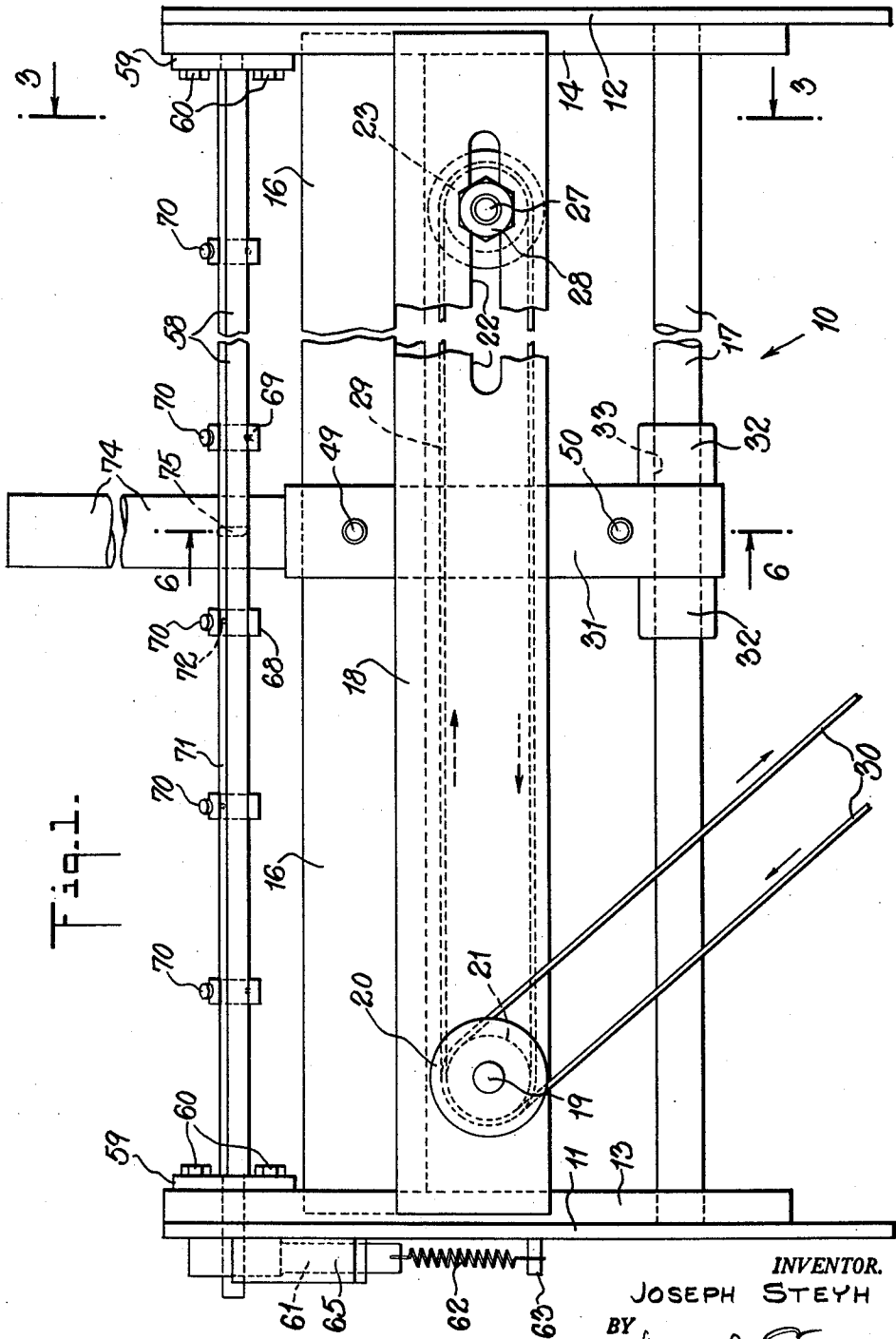


Fig. 1.

INVENTOR.
JOSEPH STEYH
BY *James J. Cannon.*
ATTORNEY

April 17, 1962

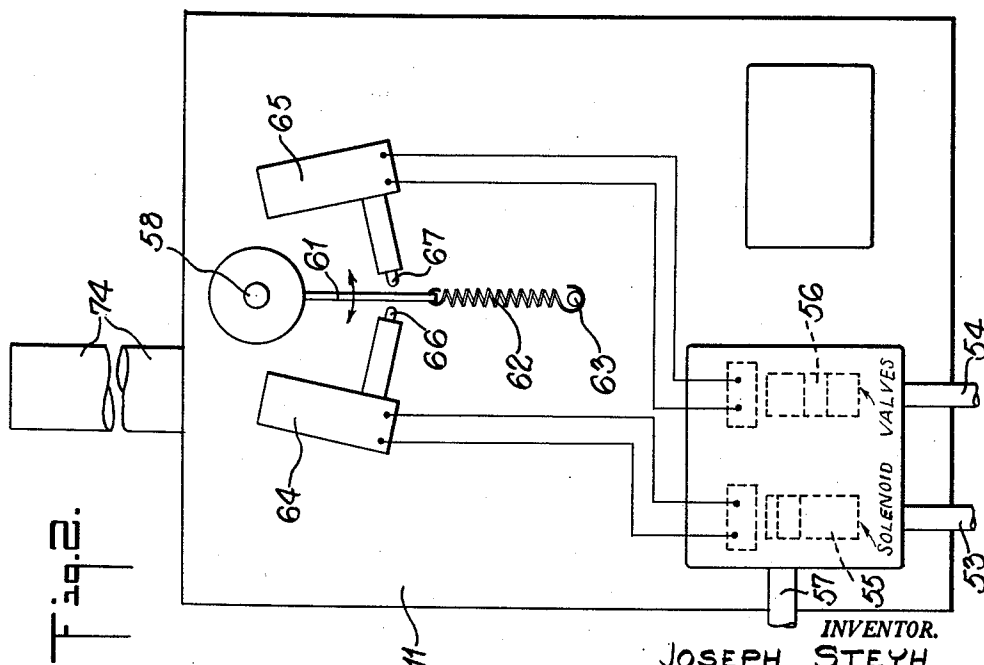
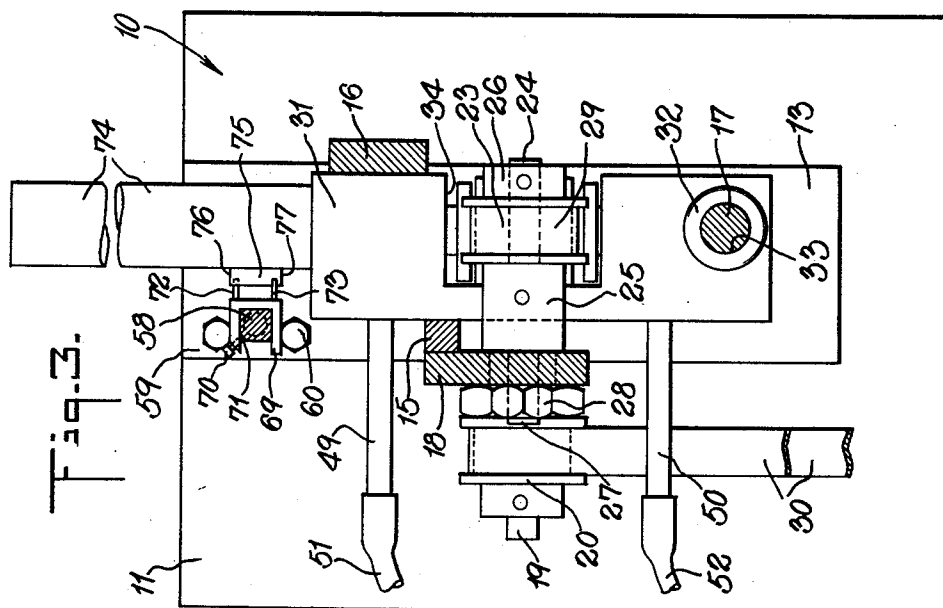
J. STEYH

3,029,649

TRAVERSING MECHANISM

Filed Dec. 15, 1959

4 Sheets-Sheet 2



INVENTOR.
JOSEPH STEYH
BY *James J. Cannon*
ATTORNEY

April 17, 1962

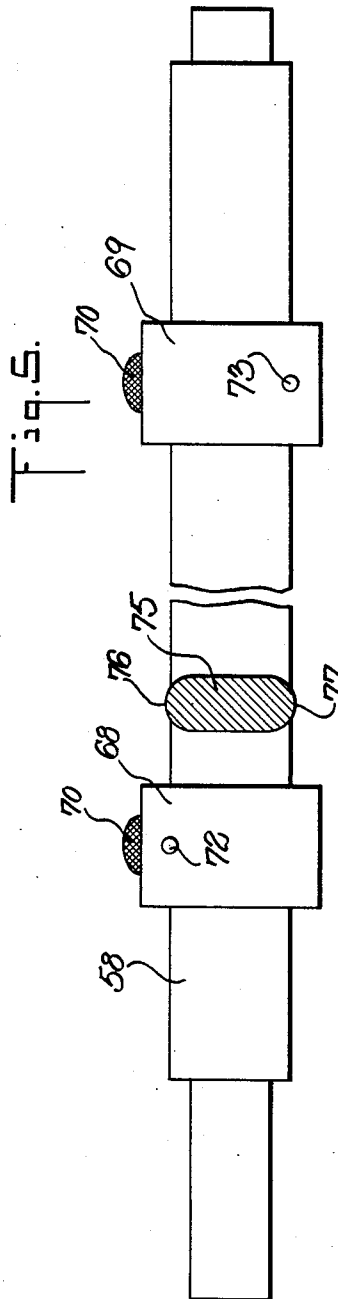
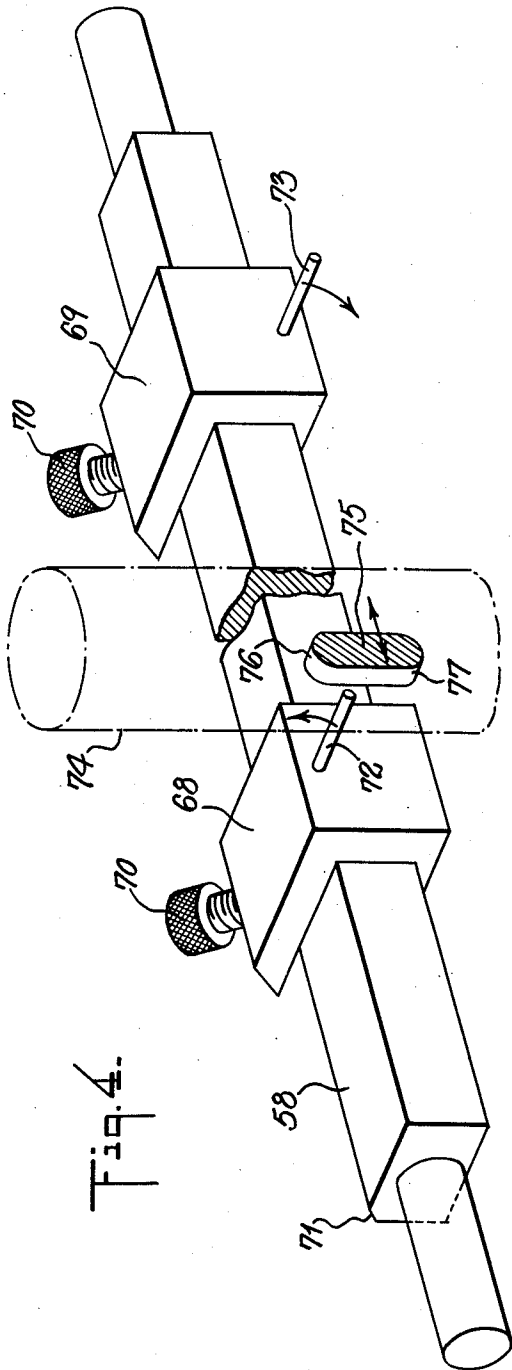
J. STEYH

3,029,649

TRAVERSING MECHANISM

Filed Dec. 15, 1959

4 Sheets-Sheet 3



INVENTOR.
JOSEPH STEYH
BY *James J. Cannon.*
ATTORNEY

April 17, 1962

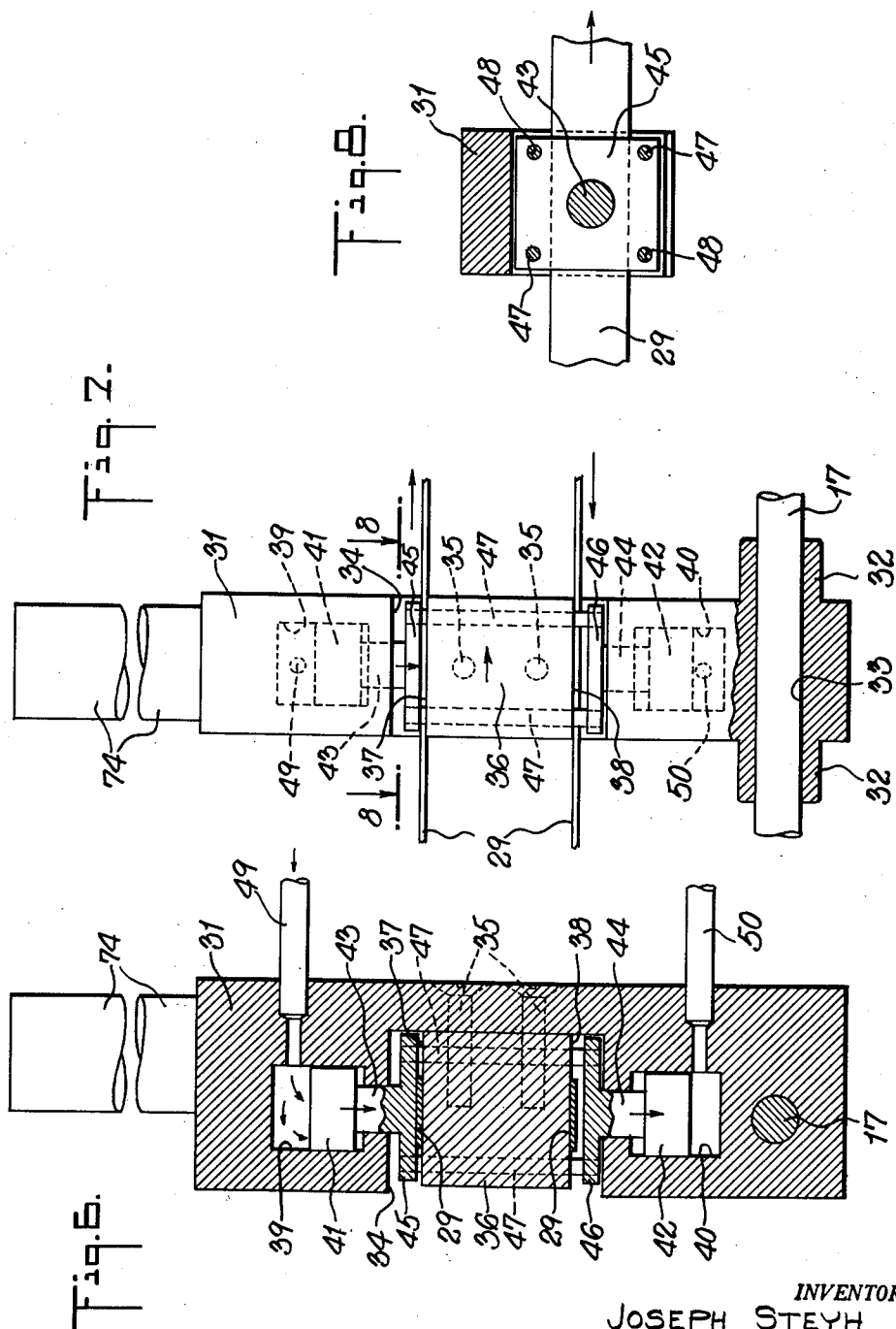
J. STEYH

3,029,649

TRAVERSING MECHANISM

Filed Dec. 15, 1959

4 Sheets-Sheet 4



INVENTOR.
JOSEPH STEYH
BY *James J. Cannon*
ATTORNEY

1

3,029,649

TRAVERSING MECHANISM

Joseph Steyh, 140 Cliff St., Haledon, N.J.

Filed Dec. 15, 1959, Ser. No. 859,741

3 Claims. (Cl. 74—37)

This invention relates to traversing mechanisms and is directed particularly to improvements in traversing mechanism of the type used for continuously layer winding textile or extruded plastic tapes, ribbons and the like on spools in quantity production and also for any other form of required reciprocal motion.

The principal object of this invention is to provide a traversing mechanism of the above nature which can readily be adjusted, both with respect to speed and length of traverse, even while the machine is in operation.

A more particular object of the invention is to provide a traversing mechanism of the character described which utilizes a variable speed, unidirectional timing belt in the form of an elongated loop as motive power, and which comprises a traverse carriage, slidably movable along the length of the timing loop and having means to engage first one and then the other of the forward and reverse lengths of the loop for immediately and repeatedly reversing carriage direction.

Still another object of the invention is to provide a traversing mechanism of the above nature including pneumatic clamps for reversing engagement of the traverse carriage with the timing belt loop lengths, and solenoid air valves for controlling the pneumatic clamps energized by limit switches actuated by abutment mechanism controlled by the carriage.

Another object is to provide a traversing mechanism of the above nature which will be economical to manufacture, and readily adaptable to a wide range of traverse mechanism applications, yet which is simple, dependable, accurate, and durable in use.

Other objects, features and advantages of the invention will be apparent from the following description when read with reference to the accompanying drawings. In the drawings, wherein like reference numerals denote corresponding parts throughout the several views:

FIG. 1 is a side elevational view of a traversing mechanism embodying the invention,

FIG. 2 is an end elevational view thereof illustrating the electrical reversal control mechanism,

FIG. 3 is a vertical cross-sectional view taken along the line 3—3 of FIG. 1 in the direction of the arrows,

FIG. 4 is a perspective view showing the cam actuated reversal mechanism and related parts,

FIG. 5 is a side elevational view of the mechanism shown in FIG. 4,

FIG. 6 is a vertical cross-sectional view taken along the line 6—6 of FIG. 1 in the direction of the arrows,

FIG. 7 is a front elevational view of the traverse carriage, and

FIG. 8 is a horizontal cross-sectional view taken along the line 8—8 of FIG. 7 in the direction of the arrows.

Referring now in detail to the drawings, the reference numeral 10 in FIG. 1 designates, generally, a traversing mechanism embodying the invention, the same comprising a pair of spaced, parallel, rectangular end plates 11, 12 against the inside faces of which are secured as by welding or machine screws (not illustrated), a pair of flat, vertically-extending rectangular support bars 13, 14, respectively. Vertically arranged flat cross bars 15, 16 extend between the support bars 13, 14 and are fixed thereto at each side, such as by welding, and serve to fix said support bars and their respective end plates 11, 12 in spaced parallel relation.

A transverse guide rod 17 is fixed at each end in the

2

support bars 13, 14 and disposed in parallel relation below and between said support bars (see FIG. 3). Fixed along the outside of the cross bar 15 is a wide, flat bearing support bar 18 within which is journaled, near one end, a pulley shaft 19 carrying a drive pulley 20 at its outer end and a belt pulley 21 at its inner end, i.e. between the cross bars 15, 16. Near the opposite end of the support bar 18 there is provided a longitudinally-extending slot 22 in alignment with the axis of the pulley shaft 19. A second belt pulley 23 is rotatably journaled on a reduced diameter portion 24 at one end of a shaft 25 and held thereon by a collar 26. The other end of the shaft 25 is formed with a reduced diameter threaded portion 27 which extends through the slot 22 in the support bar 18 and is secured in adjusted position therein by a nut 28. The belt pulleys 21 and 23 are in horizontal alignment and carry, looped between them, a flat timing belt 29, which may be of leather or rubberized fabric for example. A drive belt 30 (FIGS. 1, 3) communicating between the drive pulley 20 and the pulley of a variable speed electric motor (not illustrated) serves to keep the timing belt 29 in continuous, unidirectional motion while the traversing mechanism is in operation as hereinbelow explained.

Slidably arranged between the cross bars 15, 16 and on the guide rod 17 is a rectangular traverse carriage body member 31. The transverse carriage body member 31 is formed with bosses 32 at each side and having a side-to-side bore 33 through which the guide rod 17 extends. The front and back faces of the carriage body member 31 are in face-to-face sliding contact with the opposed inner faces of the cross bars 16, 15, respectively.

A rectangular recess 34 is provided in the front surface of the carriage body member 31 allowing passage of the timing belt 29 (FIGS. 3, 6, and 7).

Means is provided to clampingly engage the carriage body member 31 with one or the other, selectively, of the upper and lower lengths of the timing belt 29. To this end, there is fixed within recess 34 of the carriage body member 31, as by machine screws 35, a rectangular anvil 36 having upper and lower flat surfaces 37, 38 in close proximity to the inner surfaces of the upper and lower lengths, respectively, of the timing belt 29. Opposed, vertical upper and lower cylinder bores 39, 40, are formed in the carriage body member 31 within which are slidably disposed upper and lower pistons 41, 42 respectively, having axial piston rod portions 43, 44 terminating in flat rectangular clamp plates 45, 46, respectively. The clamp plates are interconnected for simultaneous motion by corner guide pins 47 slidably in guide pin openings 48 in the anvil 36 (see FIGS. 6, 7 and 8).

Pneumatic means is provided for forcing one or the other, selectively, of the pistons 41, 42 outwardly in its bore so that its clamp plate will clamp the corresponding upper or lower length of the timing belt 29 against the anvil 36, while unclamping the other length. To this end, the inner ends of the upper and lower cylinder bores 39, 40 communicate, through conduits 49, 50 (see FIG. 6) and flexible hoses 51, 52 (see FIG. 3), with the outlet ports 53, 54, respectively, of two-way, solenoid-actuated air valves 55, 56 (see FIG. 2) supplied with a source of air under pressure (not illustrated) through a common inlet conduit 57.

Means is provided for actuating the air valves 55, 56 (see FIG. 2) for reversing the clamping action of the pistons 41, 42 at the ends of the length of travel of the traverse carriage body member 31 (see FIG. 6). To this end, a square rocker shaft 58 is journaled in bearing blocks 59 fixed against the vertical support bars 13, 14 as by machine screws 60, extending parallel to and above the traverse carriage body member 31. The front end of the rocker shaft 58 extends through the front end plate

3

11 where it has fixed thereon a downwardly-extending blade 61 resiliently held in the vertical position by a coil tension spring 62 having one end hooked to the end of said blade and the other end hooked about a pin 63 in said plate (see FIGS. 1 and 2). Microswitches 64, 65 are mounted on the end plate 11 at each side of the blade 61, and have actuation buttons 66, 67, respectively, positioned to be actuated when said blade moves to the left or to the right, selectively, in the manner now to be described (see FIG. 2).

Adjustably mounted along the rocker shaft 58 at each side of the traverse carriage body member 31 are a plurality of U-shaped abutment members 68, 69 securable to said shaft by thumb screws 70, acting against a beveled corner 71 along said shaft. The abutment members 68 each carry a pin 72 extending outwardly of the back thereof near the upper end, and the abutment members 69 each carry a pin 73 extending outwardly of the back thereof near the lower end (see FIGS. 4, 5). A cylindrical standard 74 is fixed to and extends upwardly from the top of the traverse carriage body member 31. Secured to the standard 74 near the lower end thereof and facing backwardly in alignment with the square rocker shaft 58 and the abutment members 68, 69 thereon is a cam member 75 having upper and lower rounded end portions 76, 77, respectively, so located as to abut the upper pins 72 or lower pins 73 of the respective abutment members 68, 69 depending upon the direction in which the traverse carriage body member is moving (see FIGS. 4, 5). As illustrated in FIG. 4, movement of the standard 74 to the left will cause the cam member 75 to lift the upper pin 72 and thus swing the rocker shaft 58 counterclockwise (as viewed in FIG. 2) sufficiently to actuate the microswitch 65 and thus, through known circuitry not herein described, controlling the solenoid air valves 55, 56, reverse the air pressure from the upper cylinder 39 to the lower cylinder 40, thereby instantly releasing the clamping action against the upper length or section of the timing belt 29 and effecting clamping against the lower length or section of said belt to immediately effect reversal of travel direction of the traverse carriage body member 31 and its standard 74. When in its travel in the reverse direction the cam member 75 comes into depressing engagement with the first abutment member 69, the rocker shaft 58 will be moved clockwise (as seen in FIG. 2) to actuate the microswitch 64, and thus energize the solenoid of the air valve 55 so that air pressure will be returned again to the upper cylinder 39, whereupon the upper length of the timing belt 29 will be clamped to again immediately reverse the direction of travel of the traverse carriage body member 31 together with its standard 74. It will be apparent that the setting of the abutment members 68, 69 along the rocker shaft 58 determines the end positions of the standard 74, and that their setting can be accomplished while the machine is running to secure proper traverse by trial and error. It will also be apparent that speed of traverse can readily be controlled by adjusting the speed of the drive motor which powers the timing belt 29. Any appropriate guide mechanism can be connected to the traversing standard depending upon the application to which the mechanism is put.

While I have described and illustrated herein only one

4

form in which the invention can conveniently be embodied in practice it is to be understood that this embodiment is given by way of example only and not in a limiting sense. The invention, in brief, is limited only by the scope and spirit of the following claims.

What I claim is:

1. A traversing mechanism comprising, in combination, a pair of spaced apart pulleys, an endless timing belt looped between said pulleys, means to drive one of said pulleys continuously in one direction to cause said belt to move unidirectionally around said pulleys to provide spaced parallel belt sections moving in opposite directions, a traverse carriage body member, means mounting said carriage body member for sliding motion along the directions of motion of said belt sections, means on said carriage body member, and including pistons movable in cylinders therein, air pressure means for selectively actuating said pistons and solenoid actuated valves for controlling said air pressure means, for selectively clamping against one or the other of said belt sections for moving said carriage member slidingly along with said selected belt section, means controlled by the position of said carrier body member along the extent of said belt loop for reversing said clamping action with respect to said belt sections, a rocker shaft rotatably journaled about an axis parallel with the direction of movement of said carriage body member, a pair of abutment members movably secured along said rocker shaft, one at each side of said carriage body member, a cam member fixed with respect to said carriage body member, a first abutment element in one of said abutment members actuated by said cam member when moving in one direction and contacting said element to turn said rocker shaft in one direction, and a second abutment element on the other of said abutment members actuated by said cam member when moving in the other direction and contacting said second element to turn said rocker shaft in the other direction, and means controlled by the turning of said rocker shaft to energize one or the other of said solenoid actuated valves for reversing the actuation of said piston.

2. A traversing mechanism as defined in claim 1 wherein said energization controlling means comprises a striker blade radially fixed to said rocker shaft, and a pair of microswitches fixed with respect to the axis of said shaft and arranged to be actuated selectively, when said rocker arm is turned, depending upon the direction of turning thereof.

3. The invention as defined in claim 2 wherein said first and second elements comprises mutually off-set abutment pins, and wherein said cam member comprises an elongated member positioned between said pins and having rounded end portions operative to contact one each, selectively, of said pins at the limit positions of said carriage body member.

References Cited in the file of this patent

UNITED STATES PATENTS

479,297	McCarthy	July 19, 1892
528,412	Bryant	Oct. 30, 1894
1,582,107	Whiteside	Apr. 27, 1926
1,818,775	Williams et al.	Aug. 11, 1931
2,935,086	Lehman et al.	May 3, 1960