United States Patent

Elmore et al.

[15] **3,696,756**

[45] **Oct. 10, 1972**

[54] **CAR RETAINING CUSHIONED LATCH MECHANISM**

[72] Inventors: **Clifford L. Elmore,** Cincinnati; **Richard C. Young,** Oregonia, both of Ohio

[73] Assignee: **Teledyne Mid-American Corporation,** Los Angeles, Calif.

[22] Filed: **Feb. 1, 1971**

[21] Appl. No.: **111,332**

[52] **U.S. Cl.** .....**104/251,** 29/33 P, 29/33 Q, 104/252, 198/19

[51] **Int. Cl.**.....**B23q 5/22,** B61k 7/08, B61k 7/18

[58] **Field of Search**.....29/33 R, 33 P, 33 Q; 46/40; 104/119, 251, 292; 198/19

[56] **References Cited**

UNITED STATES PATENTS

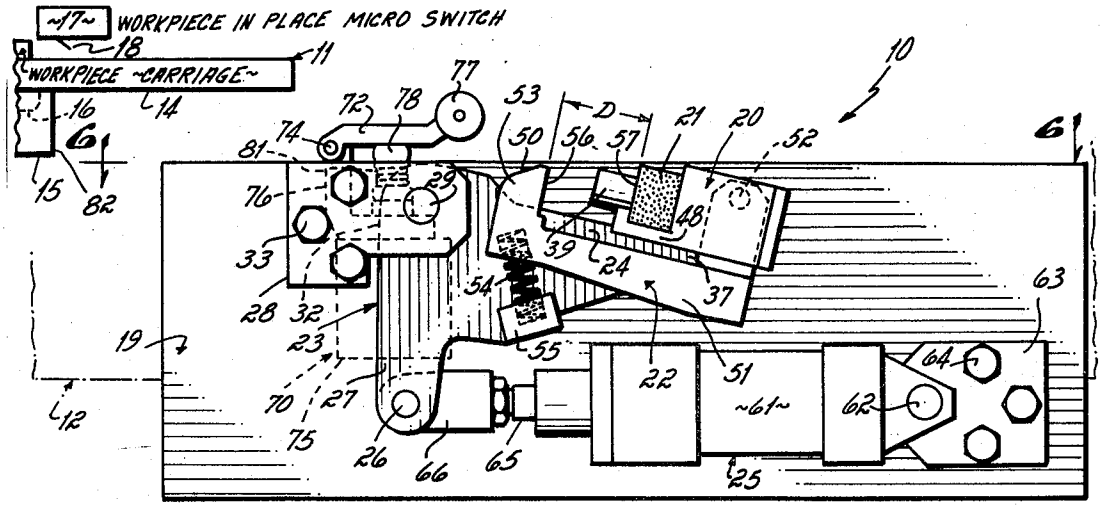
642,315	1/1900	Fitton et al.	104/251 X
1,130,055	3/1915	Baum	104/251
1,622,059	3/1927	Stockemer	104/251
2,729,668	12/1955	Bonanno	46/40
3,039,176	6/1962	Deschenes	29/33
3,343,645	9/1967	Doerfling	198/19
3,518,945	7/1970	Raney et al.	104/119

Primary Examiner—Arthur L. La Point
Assistant Examiner—Howard Beltran
Attorney—Wood, Herron & Evans

[57] **ABSTRACT**

A cushioned latch mechanism for use with a workpiece transfer system of the type wherein a workpiece is carried along a track from one work station to another, while seated on an independently movable vehicle or carrier. The mechanism includes vehicle movement slowing and stopping means which cushions the stop of the vehicle at a work station or other predetermined position, and a latch which blocks rebound movement of the vehicle from the stop point and thereafter holds it in predetermined position. The stopping means and the latch are both mounted on a common movable member which is movable between (a) a vehicle engaging position where the stopping means and latch stop and lock the vehicle at the predetermined position, and (b) a retracted position where the stopping means and latch are moved out of the vehicle's path to permit same to proceed past the predetermined position.

13 Claims, 7 Drawing Figures



PATENTED OCT 10 1972

3,696,756

SHEET 1 OF 3

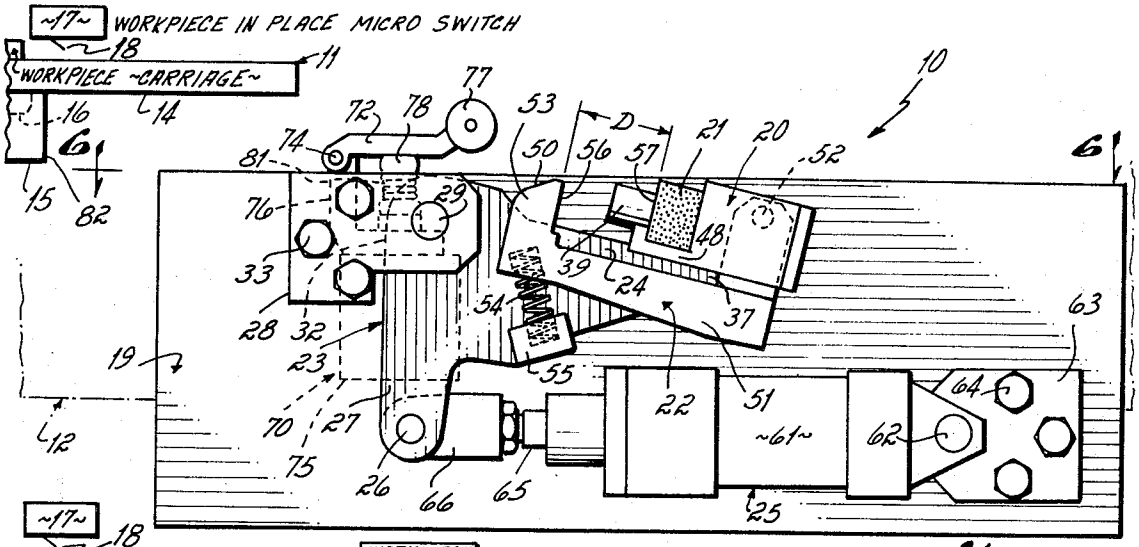


Fig. 1

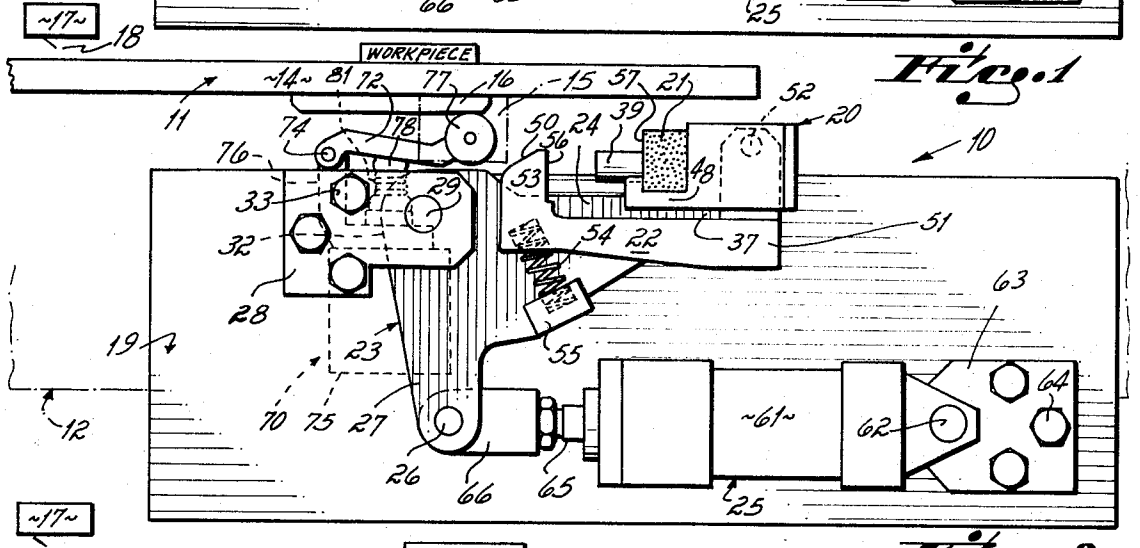


Fig. 2

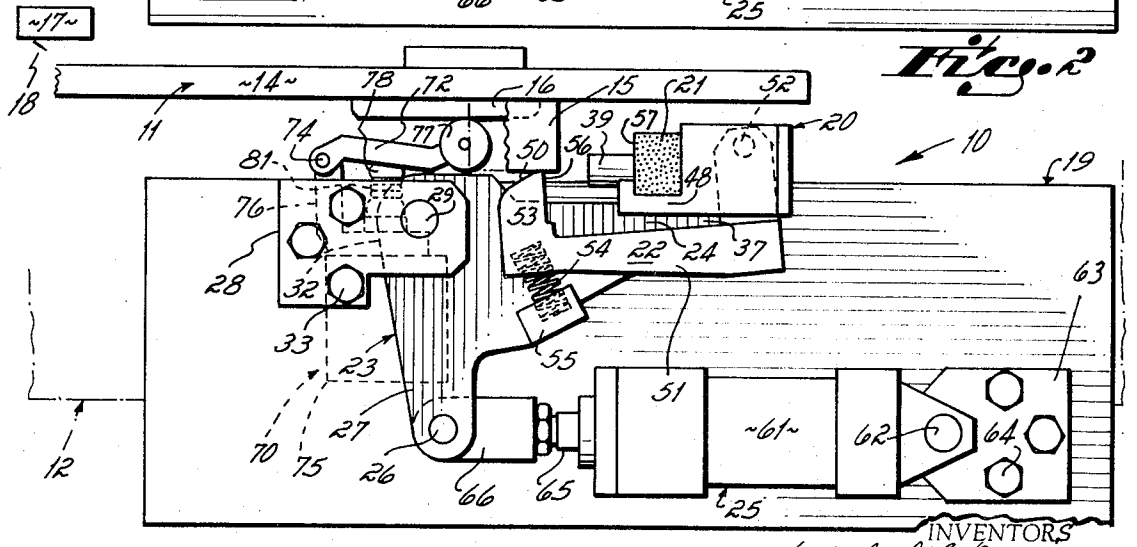


Fig. 3

INVENTORS
Clifford T. Elmore
BY Richard C. Young
Wood, Herron & Evans
ATTORNEYS

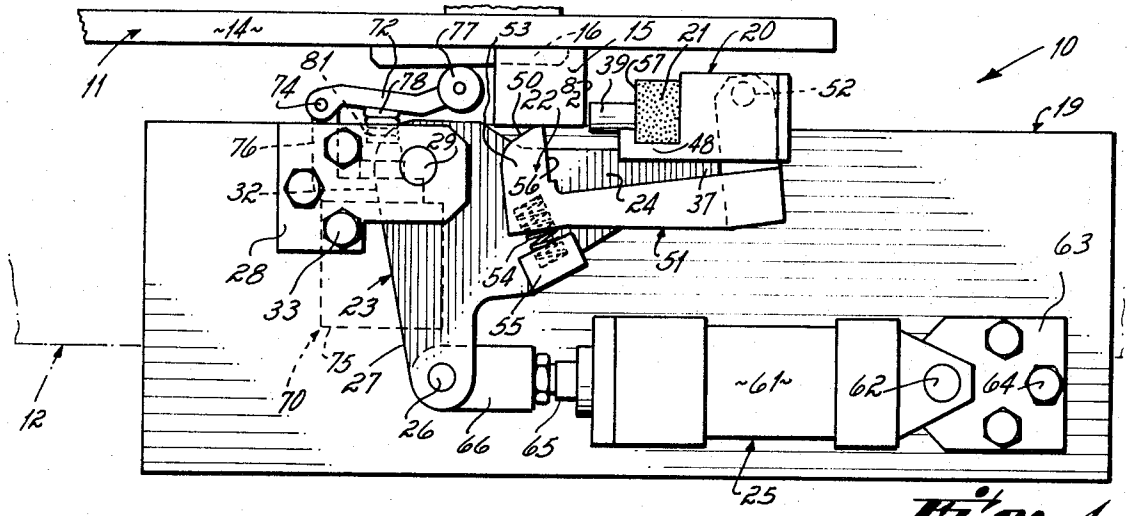


Fig. 4

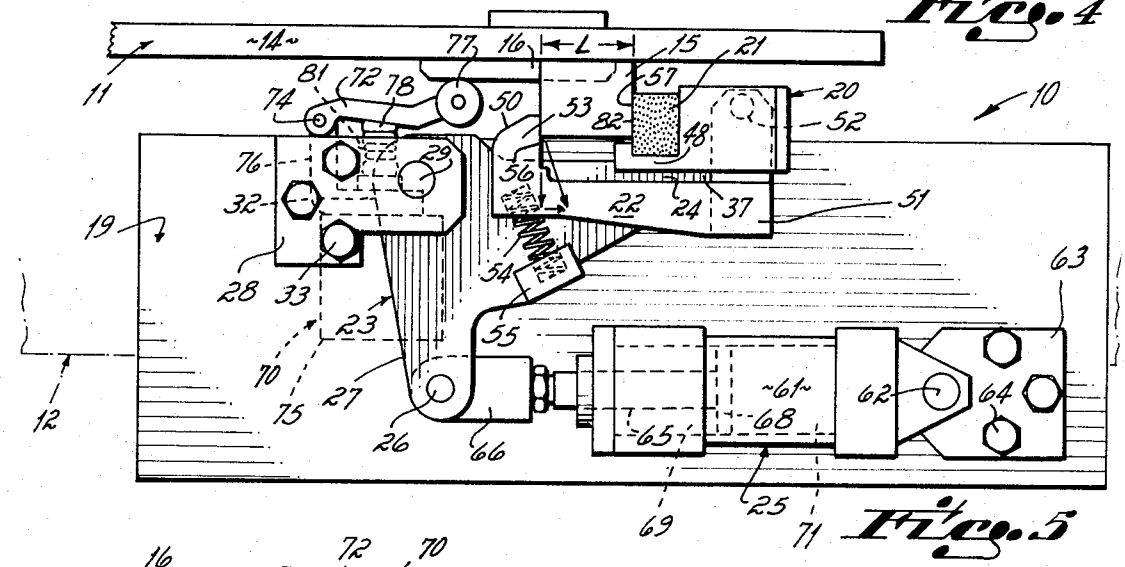


Fig. 5

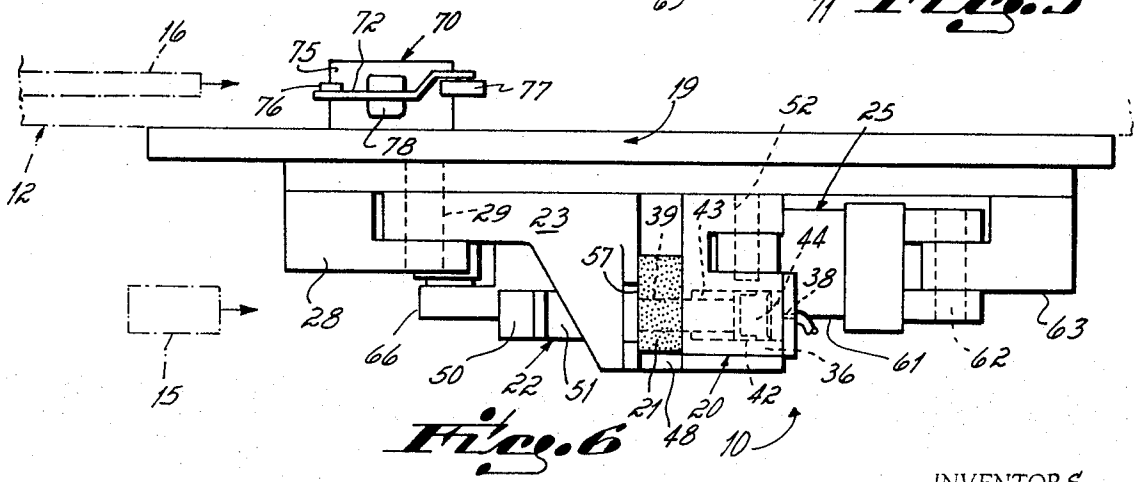


Fig. 6

INVENTORS
Clifford L. Elmore
BY Richard C. Young
Wood, Herron & Evans
ATTORNEYS

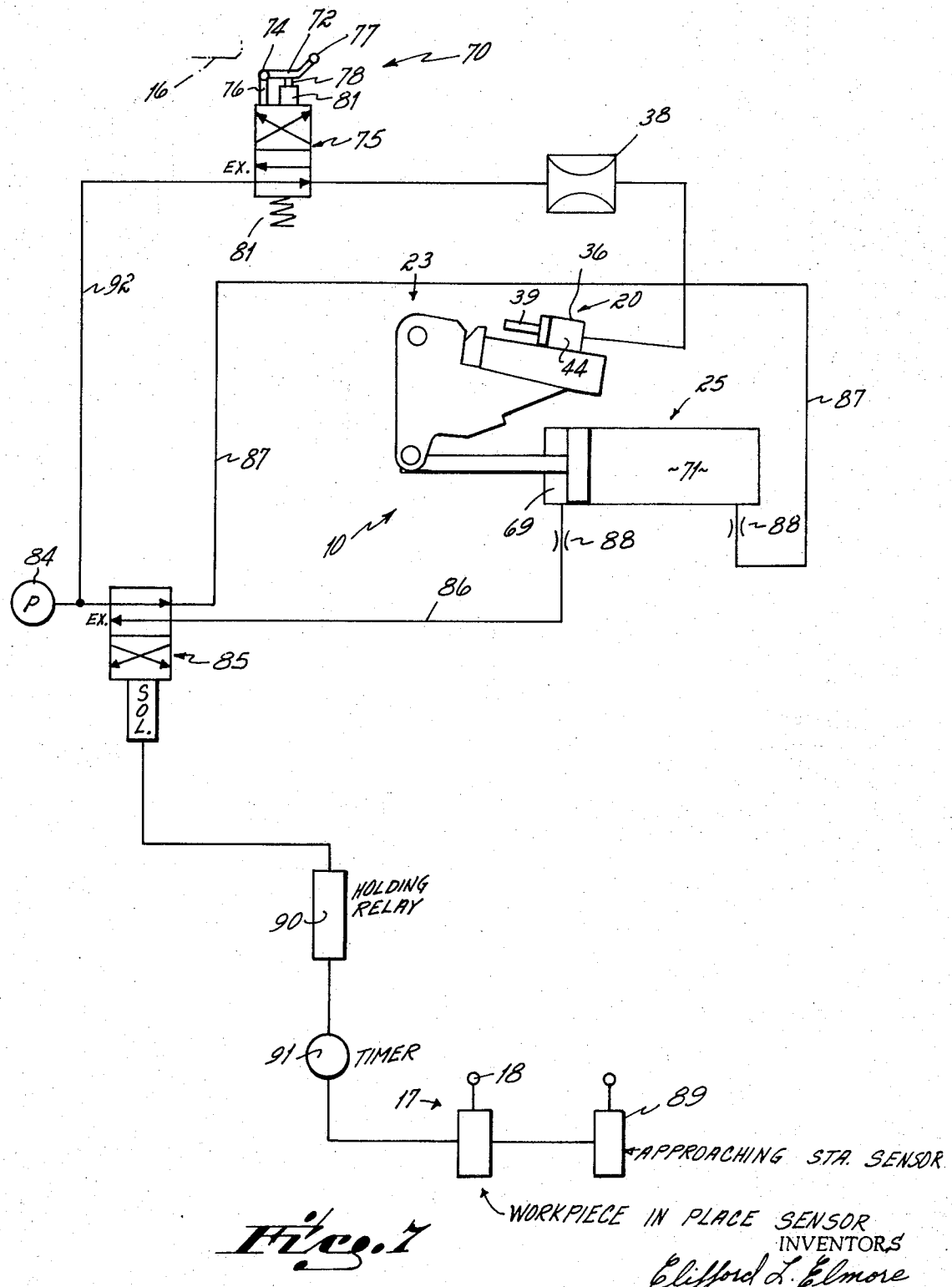


Fig. 1

INVENTORS
Clifford L. Elmore
BY Richard C. Young
Wood, Herron & Evans
ATTORNEYS

CAR RETAINING CUSHIONED LATCH MECHANISM

This invention relates to a vehicle arresting mechanism and, more particularly, relates to mechanism for stopping an independently movable workpiece carrying vehicle at a predetermined position along a predetermined path of conveyance.

The broad concept of non-synchronous or independently moving workpiece transfer systems is known to the art, as shown for example in Deschenes et al. U.S. Pat. No. 3,039,176, and in Raney et al. U.S. Pat. No. 3,518,945. Such systems basically include a series of work stations along a predetermined track or line along which workpieces are conveyed on individual carriages or vehicles. The work stations perform operations on the workpieces as the latter are delivered on the vehicles. The work performed may involve, for example, assembly operations such as welding, rivetting, bolt running; forming operations such as drilling or grinding, or testing.

The vehicle on which a workpiece is carried proceeds independently of other vehicles, from one station to another; that is, the vehicles do not all move simultaneously or in synchronism, but rather start and stop depending on their individual status. By way of example but not limitation, one type of vehicle used in such work transfer systems is a self-propelled car guided by, and riding on, tracks as it moves from one work station to another. The vehicle may be driven by a self-contained stallable electric motor, that drives the vehicle forward whenever the car is free to advance. The vehicle moves from an upstream station toward a downstream station when the work performed at the upstream station has been completed, without waiting for the completion of work on other workpieces on other vehicles at other stations. Such systems offer greatly increased assembly rate, in comparison to synchronous systems.

Latch mechanisms by which a vehicle can be stopped and locked at a predetermined position along a guide path are, of course, known to the art, as shown in Bonanno U.S. Pat. No. 2,725,668, and in Doerfling U.S. Pat. No. 3,343,645. In many non-synchronous installations, however, it is desirable that the workpiece vehicle be stopped and secured at a predetermined position or work station very quickly after the vehicle arrives at that position. Delays in stopping or positioning the vehicle slow the rate of operation of each station. Moreover, work is often performed on the workpiece while it remains on the vehicle which carries it and thus, vehicle position determines the orientation of the workpiece with respect to the work performing apparatus. It is therefore also important that the vehicle be stopped and positioned quickly within the given tolerance limits. For example, in the case of performing a drilling operation on a part while the part is on the vehicle, the vehicle must be positioned accurately (i.e., within the acceptable tolerances) so that the drilling operation will be carried out at the desired point on the part.

By way of increasing rate of transfer, higher vehicle speeds are being used. At the present time, transfer rates of 90 feet per minute, and even higher, are being used. At such rates, and especially where the workpiece and/or vehicle is heavy, it is desirable or necessary to slow the vehicle gradually as it approaches a work station, to prevent workpiece disalignment or damage by impact shock to the workpiece or the vehicle, or to other adjacent vehicles. This invention provides vehicle movement slowing and cushioning means effective for this purpose.

If a vehicle is stopped abruptly at a work station, there is often a tendency for the vehicle to rebound or bounce back, away from the work station. If the work operation is started during such rebound while the workpiece is disaligned and moving, jamming or improper work performance will result. On the other hand, delay of the initiation of the work operation, during vehicle return to the proper position, slows the rate of production.

It is an advantage of this invention that is provides an economical cushioned latch mechanism which performs all of these functions in arresting a workpiece vehicle in a work station at a predetermined position: namely, the function of gradually slowing or cushioning the vehicle as it is stopped in a work station; the function of accurately locating the vehicle as it is cushioned to a stop in the predetermined position, and the function of latching the vehicle in the predetermined position so that it cannot rebound therefrom.

In some instances it is desirable to permit a vehicle to pass through a given work station, without stopping. This is the case, for example, when that work apparatus is not needed for the particular part being transported, or where no part is on the given car, having earlier been removed for defect or other reason. It is a further advantage of this invention that the mechanism is responsive to flagging or indicating means on the car, to stop the car or to permit it to pass the given station. Depending on whether an oncoming vehicle is to be stopped or not, the slowing, stopping and latching mechanism is moved into or out of the path of vehicle travel, between an engaging attitude at which the vehicle is stopped and locked at a predetermined position, and a retracted attitude at which the mechanism does not engage the vehicle.

In preferred form the mechanism includes a movable bell crank which carries both the cushioned stopping means and a latch member which is cooperable with the stopping means. The cushioned stopping means are in the form of a dashpot. The latch member is pivoted on the bell crank, which can be swung between a retracted position, in which both the dashpot and latch are clear of the vehicle path, and an extended position in which the elements can engage the vehicle as it approaches. The bell crank is operated by a piston which in turn is responsive to a controller which senses the approach of a vehicle and which can also sense the presence or absence of a proper workpiece on the vehicle, so that the bell crank is moved into vehicle engaging position only when a vehicle is approaching with a proper workpiece mounted on it. Optional timing means are provided whereby at the conclusion of a predetermined period of time after vehicle arrival at the predetermined position, the piston is pressurized to move the bell crank to retracted position thereby releasing the vehicle and permitting it to proceed under its own power to the next station.

Other advantages of the invention will be more apparent from the following detailed description, taken in conjunction with the drawings, in which:

FIG. 1 is a side elevation of a preferred form of cushioned latch mechanism in accordance with this invention, with the mechanism in the retracted attitude as a workpiece carrying vehicle is approaching the mechanism from the left and travelling toward the right as shown in the figure;

FIG. 2 is similar to FIG. 1, but illustrates the cushioned latch mechanism responding to the approach of a vehicle to be stopped, with the mechanism now in the engaging attitude;

FIG. 3 is similar to FIG. 2 but illustrates the camming open of the latch as the vehicle approaches more closely the slowing and stopping means;

FIG. 4 is similar to FIG. 3 but illustrates the initial engagement of the slowing and stopping means with the vehicle, incrementally later than the relation shown in FIG. 3;

FIG. 5 is similar to FIG. 4 but illustrates the relation of the elements when the vehicle has been captured in the latched or locked attitude;

FIG. 6 is a top view taken along the line 6—6 of FIG. 1; and

FIG. 7 is a diagrammatic view of a control circuit for operating the mechanism.

The environment of the cushioned latch mechanism 10 of this invention is particularly illustrated in FIGS. 1 and 6. The mechanism 10 is associated with a workpiece transfer system (not toally shown) including a rail or track 12, over which a workpiece vehicle or carriage 11 (not completely shown) moves. The track and vehicle may be of the type described in detail in the Raney et al patent previously identified. The latch mechanism 10 is secured beside the track 12 at each work station, at such position that the workpiece will be stopped and locked therein by the means to be described, in the desired alignment with the work machinery.

Vehicle 11 rides on rollers or wheels not shown, and includes a platform, jig or bed 14. A latch block 15 is mounted to and projects from the vehicle, and is adapted to be engaged by the mechanism 10 and stopped and locked. A signal block 16 is also fixed to the vehicle, and is positioned to cooperate with a valve operator of the cushioning means, as will be explained. Each workpiece vehicle 11 of the system may be similarly structured, thereby allowing each vehicle to cooperate with the cushioned latch mechanism 10 at each work station.

Each work station may optionally include sensing means in the form of microswitch 17, mounted adjacent track 12. The switch 17 has a contactor or actuating arm 18 disposed to engage a workpiece, if a workpiece is in fact properly oriented on the vehicle bed 14; the microswitch 17, therefore, senses whether or not a workpiece is presented for work to be done thereon, requiring the vehicle to be stopped at the station. As shown in FIG. 7 and described in detail subsequently, switch 17 is interconnected with the mechanism 10 so that when the switch arm 18 is actuated by a workpiece in place on the bed 14, mechanism 10 is "authorized" or permitted thereafter to engage, cushion and latch the vehicle in the work station. When no workpiece is in place on the vehicle's bed 14 the switch 17 is not actuated and mechanism 10, as will be explained, is not positioned to engage latch block 15, and the vehicle is thereby allowed to continue on downstream past the work station.

The structure of the cushioned latch mechanism 10 is particularly illustrated in FIGS. 1, 2, and 6. The mechanism includes slowing and stopping means in the form of a dashpot 20 that slows and cushions forward motion (i.e., rightward motion as seen in the drawings) of the vehicle 11 by acting on latch block 15 as the vehicle approaches the predetermined position. The dashpot 20 also incorporates a stop or abutment 21 that stops forward motion of latch block 15 on the vehicle 11 at the predetermined position, the stop being in the form of a steel block or, if additional cushioning is needed, a rubber bumper.

Mechanism 10 also includes a latch 22 engageable in latching relation, behind (i.e., to the left of) block 15, to restrain bounce back or rebound movement of the vehicle 11 from the predetermined position once the vehicle reaches that position. Once engaged, bumper stop 21 and latch 22, in cooperation with each other, function to hold and restrain or lock the vehicle 11 at the predetermined position in the work station, throughout the work operation carried out within that work station.

Mechanism 10 also includes a movable member in the form of a bell crank 23. One arm 24 of the bell crank mounts both the dashpot 20 and latch 22. A prime mover in the form of a piston 24 is pivotally connected, as at 26, with the bell crank's other arm 27. In general, the piston 25 and/or dashpot may be hydraulic or pneumatic; they are illustrated herein as pneumatic. The bell crank 23 is pivotally mounted on a bracket 28 by a pin 29 at its elbow 32, the bracket 28 being fixed to the base plate 19 by bolts 33. Bell crank 23 is pivotable about the pin 29 so as simultaneously to move both the dashpot 20 and latch 22, mounted to it, between the engaging attitude (FIG. 2) where they are positioned for slowing, latching and locking the workpiece vehicle in the work station at the predetermined position, and a retracted position (FIG. 1) where the dashpot and latch are both removed from the path of vehicle latch block 15 and cannot engage it, so that the vehicle can proceed through the work station.

Dashpot 20 includes a cylinder 36 (see FIG. 6) fixed at the end 37 of the bell crank arm 24. Cylinder 36 is pressurized through a restricted orifice 38 at the downstream (rightward) end, and carries a dashpot piston pin 39 that slides in the cylinder and is extendable upstream of the cylinder. The dashpot pin 39 mounts a piston 42 within the cylinder, which defines a pressure chamber 44 to the right of it. The pin 39 is movable between an extended position (FIG. 1) when pressure fluid is admitted to chamber 44, and a retracted position (FIG. 5) when the fluid is forcibly displaced from chamber 44 through orifice 38.

The stop or abutment block 21 is seated and mounted in a projecting lip or shoulder 48 extending upstream of the dashpot cylinder 36. Dashpot pin 39 passes centrally through the bumper 21 and projects upstream when it is in the extended position but not when in the retracted position (compare FIG. 1 and FIG. 6).

The latch 22 includes a latch arm 51 which is pivotally mounted to the bell crank arm 24 by pin 52. A nose or catch 53 is formed at the upstream end of the latch arm 51. The latch arm's nose 53 is provided with a sloping or cam surface 50 at its leading edge for a purpose to be described subsequently. A spring 54 biases

or urges latch arm 51 clockwise about pivot 52, toward that position illustrated in FIGS. 1 and 2. Spring 54 is seated at its other end in bell crank arm tab 55. The spring 54, therefore, urges the latch arm 51 into an attitude where the rear or latch surface 56 thereof is perpendicular to the axis of piston pin 39, and parallel to the surface 57 of bumper block 21.

As can be seen in FIGS. 1 and 5, the linear dimension D between the latch arm surface 56 and the bumper block surface 57 is substantially equal to the length L of the latch block 15 on the workpiece vehicle 11. Thus, when the latch block 15 is constrained or captured between bumper block 21 and the latch 22 as illustrated in FIG. 5, the workpiece vehicle 11 is positively located and locked in the predetermined position at the work station.

As mentioned, the bell crank 23, and hence the combined latch 22 and dashpot 20 structure, is moved between the vehicle engaging and vehicle passing positions by the piston 25. This piston includes a cylinder 61 pivotally mounted by pin 62 to bracket 63. The bracket 63 is fixed to the base plate 19 by bolts 64. Piston rod 65 extends in the upstream direction from the piston cylinder 61 and is provided with a tang or clevis 66 at its outer end that is pivotally linked by the pin 26 with arm 27 of the bell crank 23. The inner end of the piston rod 65 (see FIG. 5) is connected to a piston head 68 that divides the cylinder into an upstream chamber 69 and a downstream chamber 71. When pressure fluid is applied to the downstream chamber 71 the rod 65 is extended, thereby causing the bell crank 23 to pivot clockwise to retracted attitude; alternately, when pressure fluid is provided to the upstream chamber 69 the piston rod 65 is retracted, thereby causing the bell crank 23 to pivot counterclockwise to extended attitude.

Pressure to operate piston 25 is supplied from a pressure source 84 (see FIG. 7) through a solenoid operated, spring return valve 85. A pressure supply line 86 communicates between valve 85 and the upstream chamber 69 of prime mover or piston 25, and a supply line 87 communicates between valve 85 and the downstream piston chamber 71. The lines 86 and 87 may include damping orifices designated at 88, 88 and are not shown in FIGS. 1–6. In the normal position of valve 85, i.e., when the solenoid actuator is not energized, the valve is held by its biasing spring in the position shown in FIG. 7. Pressure air is supplied from source 84 through line 87 into the chamber 71 and chamber 69 is vented at EX. This holds the latching mechanism 10 in the retracted attitude shown. When the solenoid actuator is energized, the valve shifts, and pressure fluid is supplied through line 86 into chamber 69; the other chamber 71 is vented to exhaust through line 87, and the bell crank member is moved to extended or carrier engaging position.

A controller governs the operation of the solenoid of valve 85, and hence, the application of pressure fluid to piston 25. Although of those skilled in the art will appreciate that different controller circuits may be provided for different purposes, one suitable controller circuit is shown in FIG. 7 and includes the "workpiece in place" sensor 17. The controller may also or alternatively include a "carrier approaching station" microswitch or sensor 89. As previously explained, the sensor 17 is positioned upstream of the work station, and when a car passes is responsive to detect the presence or absence of a workpiece on the vehicle in proper position for work to be done on it. The car approaching sensor 89 is also positioned upstream of the station, adjacent to it, and indicates the impending approach of a car to the work station. The sensors 17 and 89 are preferably interconnected so that both must be actuated before the solenoid of valve 85 is energized. Thus if a car passes without a workpiece properly positioned on it, valve 85 is not shifted, and that valve is not shifted until the carrier closely approaches a station, and passes sensor 89. (In some instances the two sensing functions can be combined, or one can be omitted.) While the sensors are illustrated as electrically operated, they may be pneumatic. Both sensors 17 and 89 are connected to the solenoid of valve 85 through a holding relay circuit 90 which maintains energization of the solenoid beyond the time the car passes out of engagement with the sensors.

The controller circuit is preferably also provided with a timer 91 which regulates the duration of closure of the holding relay 90. Timer 91 may be set for a definite period of time "at station" during which the car is held for the work operation on it at the work station to be completed. When that period of time lapses the timer breaks the holding circuit and thereby deenergizes the solenoid of valve 85 so that the valve is shifted back to the position in FIG. 7. This releases the pressure in chamber 69 by venting it through line 86, and applies pressure into chamber 71 and thereby pivots the bell crank arm 23 in the clockwise direction. Vehicle 11 is thereby released so that it may proceed out of the work station to move downstream.

As shown in FIG. 7, dashpot 20 is pressurized separately from piston 25. The dashpot pressurizing circuit includes a branch line 92 from pump 84. Pressure is applied to, and is released from, dashpot 20 by a cushion operating valve means, generally at 70. Actuating means or arm 72 is pivotally mounted, as at 74, on a bracket 76 and operates a valve 75 in accordance with the position of a vehicle. The arm 72 has a roller 77 at its end, and this roller is positioned for engagement with the signal block 16 fixed to the workpiece vehicle. Arm 72 cooperates with and bears on a valve plunger 78 which controls the open-close operation of valve 75. Valve 75 is biased by spring 81 to the position shown in FIG. 7. With the valve in the normal position shown, pressure air is supplied through line 92 and the restricting orifice 38 to extend the dashpot pin 39. The pin is normally in this extended position, ready for cushioning, when bell crank arm 23 is in the retracted position. When a car comes within a predetermined position upstream of the station, the block 16 on the car comes onto and depresses valve plunger 78, thereby shifting valve 75. The connection between the pressure source 84 and orifice 38 is broken, and orifice 38 is connected to exhaust. Orifice 38 is sized to release or bleed off the pressure acting on the dashpot piston so that when the piston engages the car, the dashpot piston will be displaced inwardly to cushion the stop at an appropriate rate. Depending upon the size of orifice 38, it is ordinarily desirable to disconnect the pressure source from dashpot piston just shortly before the car impacts against the end of the dashpot pin, and the piston

should remain de-energized by engagement of block 16 with roller 77 during the entire time the car is in station.

In operation of the cushion latch mechanism, a series of steps occur that is sequentially illustrated in FIGS. 1–5. In FIG. 1 the mechanism is shown in the retracted attitude; it was directed to this attitude when the previous vehicle was released, and remains in this attitude until a subsequent workpiece carrying vehicle approaches. Note that dashpot pin 39 is extended. As a vehicle approaches, it engages sensor 89, and if a workpiece is properly in place on the vehicle it will also engage sensor 17. This indicates the need for a work operation to be performed at that work station. Valve 85 is shifted and the latch and dashpot are moved to engaging position by the prime mover 25. The timer starts timing the operation of the period that the latch arm 23 remains in the extended position.

Just before the vehicle is to be stopped, arm 72 is depressed by the vehicle signal block, see FIG. 2. At this time the pressure source is disconnected from chamber 44 of the dashpot cylinder 36. The pressure in chamber 44 starts to bleed off through orifice 38 as soon as valve 75 shifts, and it is preferable to time this event (by proper positioning of block 16) so that sufficient pressure will remain when the latch block 15 hits pin 39 to provide the desired rate of slowing.

As the workpiece vehicle 11 continues to move, the latch block 15 on the vehicle engages cam surface 50 of the latch arm nose 53 and cams or depresses the latch arm downwardly against spring 54, see FIG. 3. It will be particularly noted that as this occurs block 16 on the vehicle is still depressing valve arm 72, so that no pressure is applied to dashpot pin 39 which might cause sticking when the vehicle is to be released.

As the latch block 15 moves into engagement with the dashpot pin 39 the pin yields in the downstream direction, slowing the vehicle and cushioning its stop. The leading face 82 of the vehicle's latch block 15 engages the face 57 of bumper block 21 which positively locates the vehicle at the predetermined position. Forward momentum of the vehicle may compress block 21 (if it is resilient), and the latch 51 snaps clockwise into latching engagement behind latch block 15 thereby restraining the vehicle from rebounding out of the predetermined position. After the predetermined time interval as measured by the timer, the solenoid of valve 85 is de-energized and valve 85 shifts, so that the upstream chamber 69 of piston cylinder 25 is vented and the downstream chamber 71 is connected to the pressure source which causes piston rod 65 to extend quickly, thereby pivoting the bell crank 23 clockwise about its pivot pin.

It is important to point out that this swinging motion of the bell crank has two effects: it withdraws the latch 22 and dashpot 20 out of blocking engagement with the latch block 15, and at the same time, the swinging movement of the latch arm 23 imparts a downwardly but forwardly angulated movement vector to the latch surface 56. Since the swing is quite rapid, the forward component of this vector imparts a push or shove to the car, to accelerate it out of station. This gets the car started on its way more rapidly. The vehicle is thereafter driven by its own motor. When the vehicle has moved out of station, spring 81 reshifts valve 75, and the dashpot is again pressurized through bleed orifice 38, so it will be in the extended position when the next vehicle arrives. The mechanism 10 is now ready to receive a subsequent vehicle, cushion it to a stop, latch it in place and lock it positively at the work station, all as described above.

What is claimed:

1. A cushioned latch mechanism for use with a workpiece transfer system of the type wherein an independently movable workpiece carrying vehicle moves from one work station to another over a predetermined path, said mechanism comprising,

a movable member mounted adjacent said path, said member movable between an extended attitude and a retracted attitude with respect to a vehicle adjacent to it on said path,

resilient slowing and stopping means mounted to and moving with said movable member between said attitudes, said slowing and stopping means when in said extended attitude engaging a vehicle moving along said path and slowing forward motion thereof as the vehicle approaches a predetermined position, said resilient slowing and stopping means arresting forward motion of said vehicle at the predetermined position,

and a latch also mounted to and moving with said movable member between said attitudes, said latch when in said extended attitude engaging said vehicle in latching relation to block rebound movement thereof from the predetermined position, said latch and said stopping means cooperating to lock said vehicle in the predetermined position,

said movable member when moved from said extended attitude to said retracted attitude disengaging said both said slowing and stopping means and said latch from a vehicle and permitting a vehicle to proceed therepast.

2. A cushioned latch mechanism as set forth in claim 1 wherein said latch is moved by said movable member to push said vehicle out of station when said movable member is moved from said extended attitude to said retracted attitude.

3. A cushioned latch mechanism as set forth in claim 1 including

a controller responsive to the approach of said vehicle toward said cushioned latch mechanism, said controller actuating said member to move from the retracted attitude where said vehicle is permitted to proceed beyond the predetermined position, into the engaging attitude where said stopping means and latch are positioned to stop and lock said vehicle at the predetermined position.

4. A cushioned latch mechanism as set forth in claim 3, wherein said latch includes

a latch arm pivoted to said member, said arm adapted to restrain said vehicle from rebounding when said vehicle is in the predetermined position and when said member is in the engaging attitude,

bias means urging said latch arm into latching attitude relative to said vehicle, and

a cam surface on said latch arm by which a latch block fixed to said vehicle cams and pivots said latch arm relative to said member, said latch block being restrained by said latch arm after said vehi-

cle is slowed to a stop by said stopping means by biasing said latch arm into gripping relation with said latch block, thereby locking said vehicle at the predetermined position.

5. A cushioned latch mechanism as set forth in claim 3, wherein said stopping means comprises a dashpot including

a cylinder from which a piston pin extends, said pin being located so as to engage a vehicle when said member is in the engaging attitude,

a restricted orifice through which fluid escapes when said pin is pushed into said cylinder, and

valves means for applying and releasing pressure fluid to said piston pin,

and actuating means for operating said valve means, according to the position of a vehicle, to apply pressure before the vehicle is at station and to release pressure when the vehicle is in the station.

6. The cushioned latch mechanism of claim 5 wherein said valve means both applies pressure to, and the releases pressure from, said piston pin through said restricted orifice.

7. A cushioned latch mechanism as set forth in claim 6, wherein said stopping means and latch are mounted on one arm of a bell crank, said latch block being restrained between said latch arm and said stopping means so as to lock said vehicle at the predetermined position.

8. A cushioned latch mechanism as set forth in claim 3, wherein a reversible prime mover is connected to said member, said prime mover being actuable in response to said controller to move said member relative to the predetermined path alternatively between the engaging and retracted attitudes.

9. A cushioned latch mechanism as set forth in claim 8, wherein said controller includes

a timer interconnected with said prime mover, said timer actuating said prime mover to move said member into the retracted attitude after said member has been in the engaging attitude for a predetermined length of time corresponding to the duration of the vehicle stop.

10. A cushioned latch mechanism as set forth in claim 8, wherein said prime mover moves said member into the engaging attitude when the approach of said vehicle is sensed by a sensor, and moves said member into the retracted attitude as determined by a time cycle set on a timer.

11. A cushioned latch mechanism as set forth in claim 8, wherein said controller includes

a carrier approach sensor interconnected with said prime mover, said sensor responsive to the approach of a vehicle along said path to energize said prime mover to move said member into the engaging attitude.

12. A cushioned latch mechanism as set forth in claim 11, wherein said prime mover includes a pressure operated piston for moving said member alternately between the engaging and the retracted attitudes,

and wherein said mechanism also includes a valve responsive to said controller to apply pressure to said piston to move said member to the engaging attitude when said sensor is actuated by the approach of said vehicle.

13. A cushioned latch mechanism as set forth in claim 11, wherein said controller further includes

a second sensor, said second sensor being responsive to the presence or absence of a workpiece on said vehicle, said carrier approach sensor and said second sensor being interconnected with said prime mover to move said member to said engaging attitude when said second sensor senses a workpiece on said vehicle and said carrier approach sensor senses a vehicle at a certain point on said path, and to avoid operation of said prime mover if no workpiece is on said vehicle so as to allow said vehicle to proceed past the predetermined position.

* * * * *