

[54] **SENSOR LOCKING ACCUMULATOR**

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[52] U.S. Cl. **198/127 R**

[51] Int. Cl. **B65g 13/02**

[58] Field of Search **198/127, 160**

[56] **References Cited**

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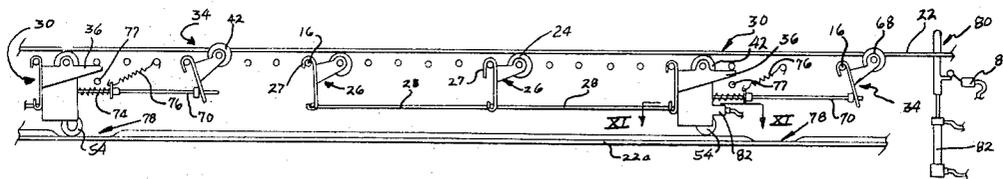
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[57] **ABSTRACT**

In accumulating conveyors of the type in which the application and release of the propelling force is effected through changes in the vertical position of the propelling member, a sensor responsive to the pressure of an article conditions an actuator which in turn is connected to the propelling member support mechanisms. The propelling member has a ribbed portion along its length, which rib is provided with a series of camming surfaces to operate the actuator when conditioned by the sensor. The actuator, when operated changes the position of the propelling member.

11 Claims, 11 Drawing Figures



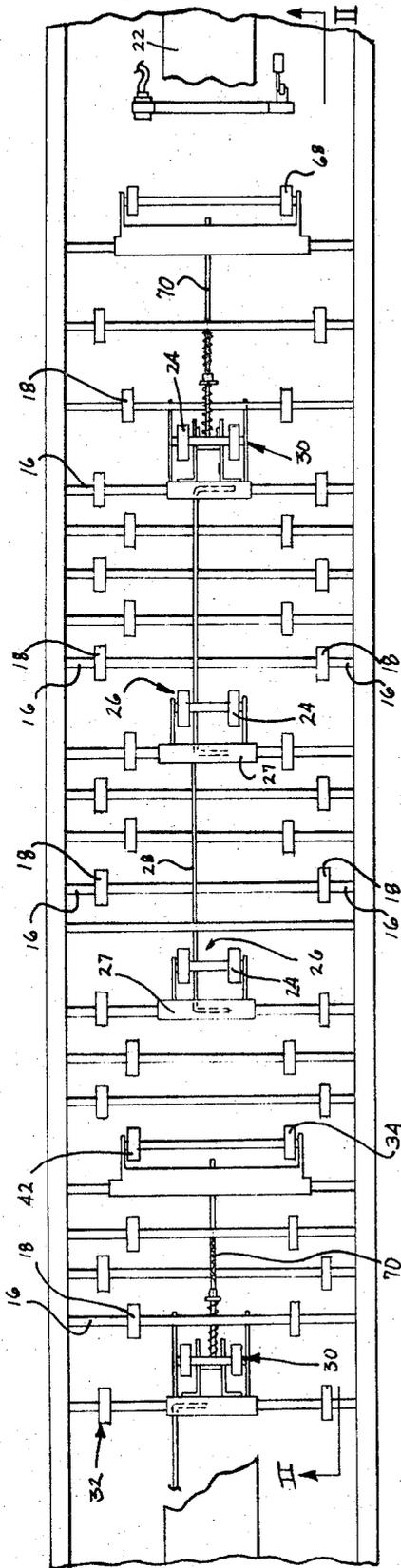


FIG. 1.

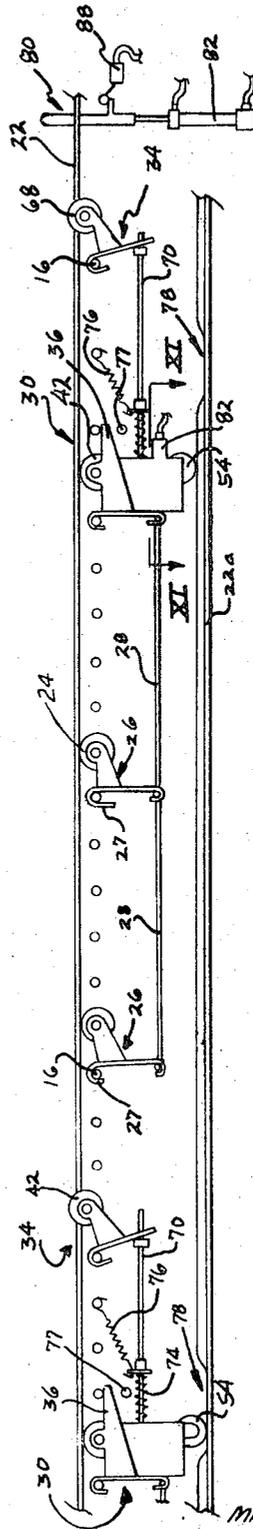


FIG. 2.

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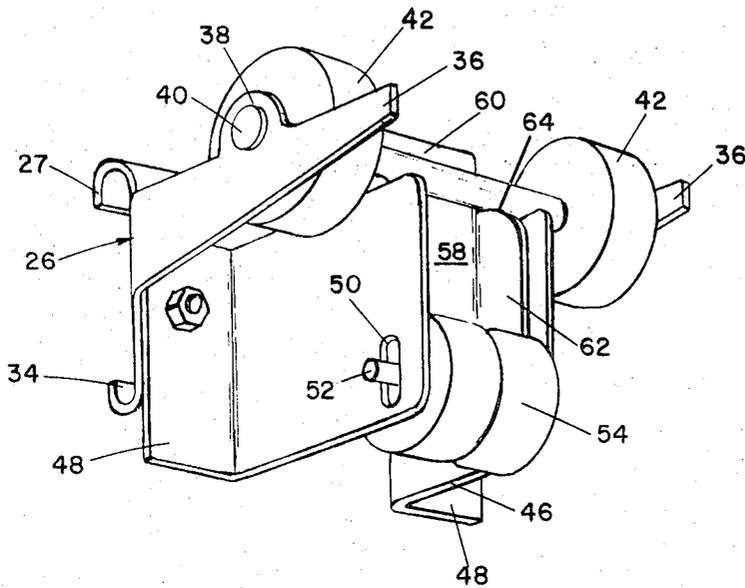


FIG. 3

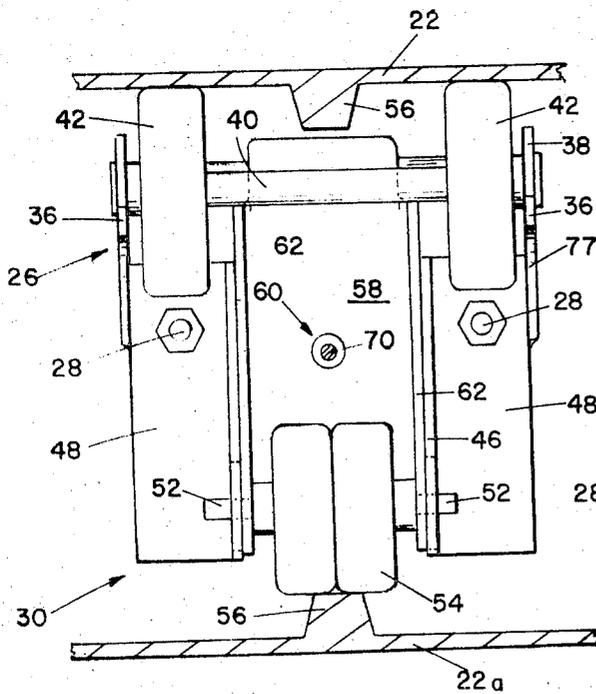


FIG. 5

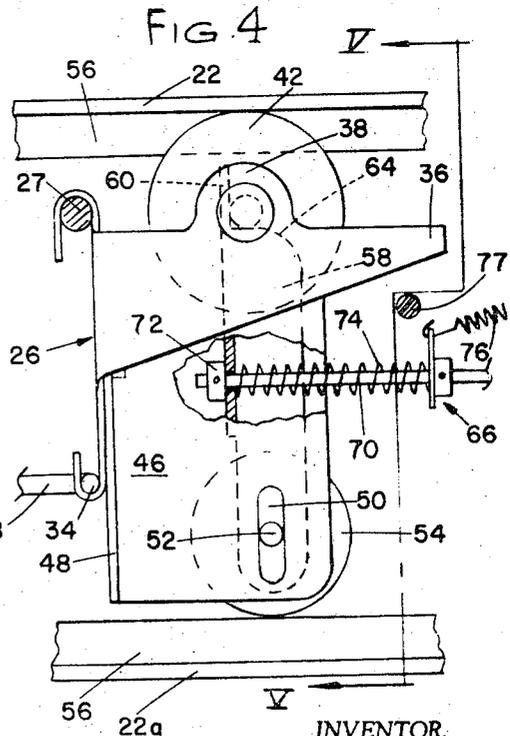


FIG. 4

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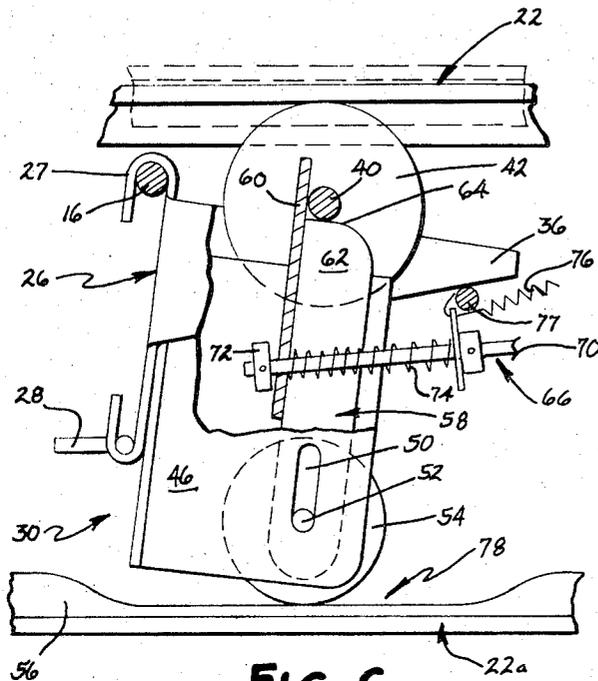


FIG. 6.

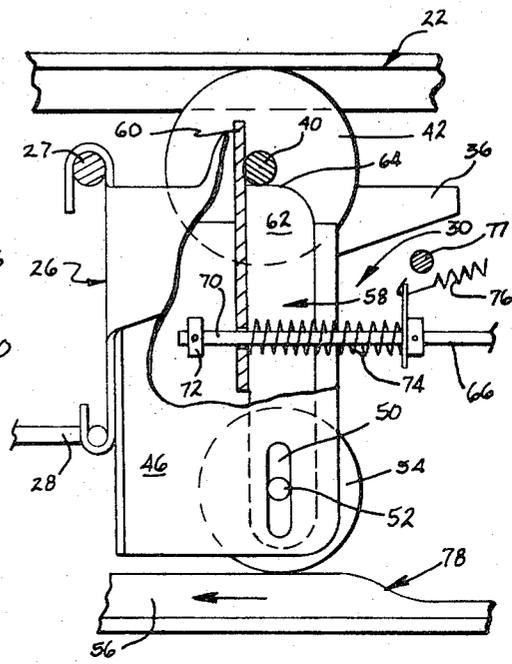


FIG. 7.

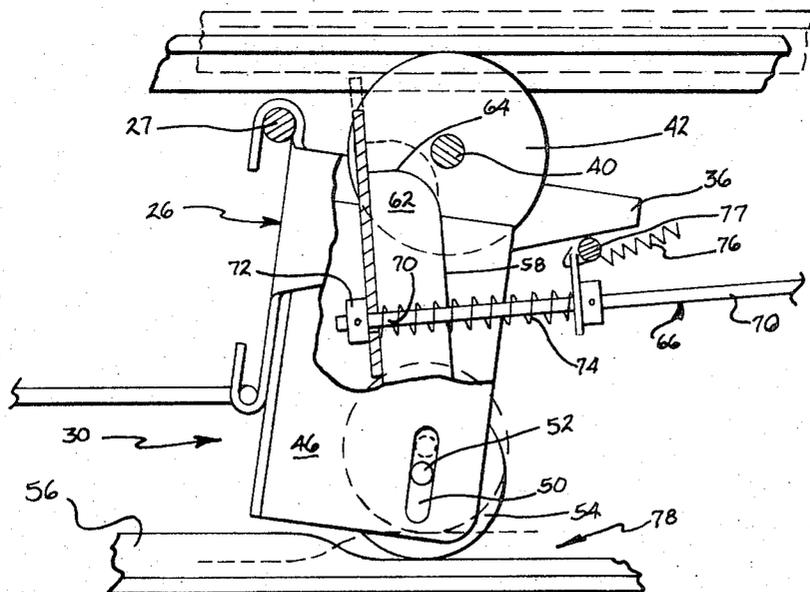


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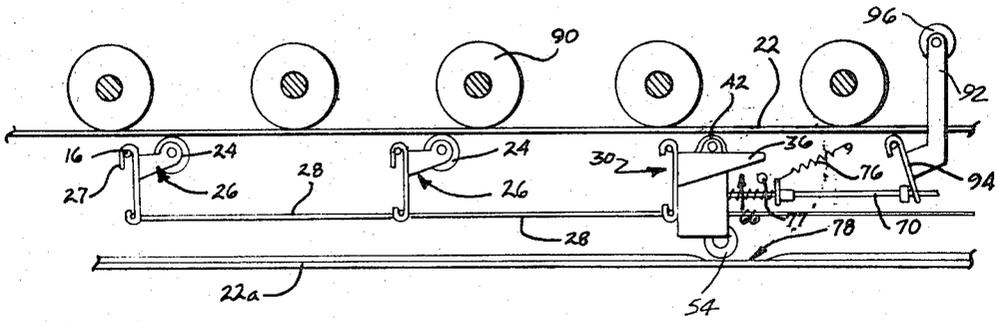


FIG. 10.

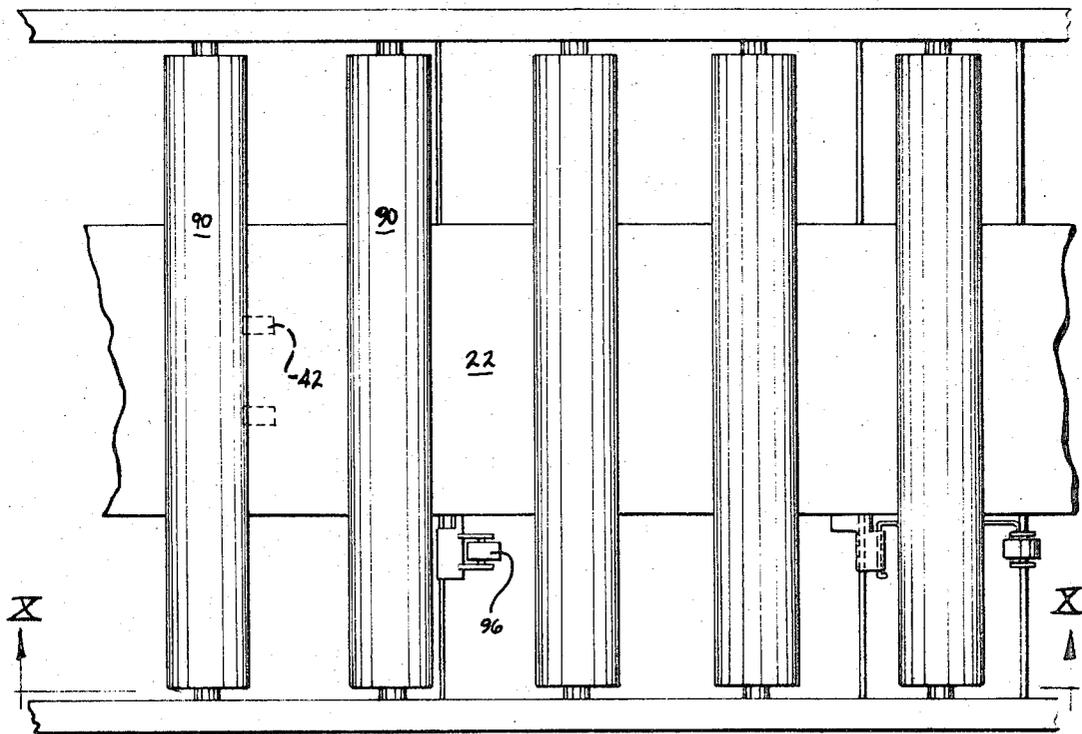


FIG. 9.

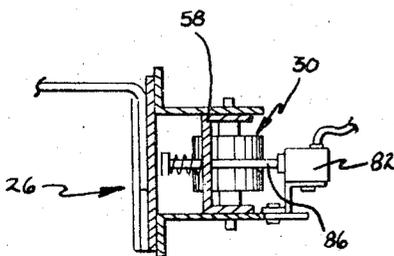


FIG. 11.

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SENSOR LOCKING ACCUMULATOR

BACKGROUND OF THE INVENTION

This invention relates to accumulator conveyors of the type operated by a continuously driven endless propelling member which releases the articles automatically in response to one of the articles remaining stationary while it is rested on the transport rollers. It is an improvement over accumulator conveyors of the type disclosed in U.S. Pat. Nos. 3,116,823 issued Jan. 7, 1964 to D. A. Schneider, 3,136,406 issued June 9, 1964 to M. J. DeGood, et. al., 3,164,246 issued Jan. 5, 1965 to M. J. DeGood, and 3,206,008 issued Sept. 14, 1965 to C. L. Bowman, et. al. In these and in similar conveyors, it has been long recognized that powered conveyors, particularly those having an endless chain or belt drive have adequate reserve power in the propelling member for operating various types of devices which may be utilized along the conveyors. Generally in these conveyors, the propelling member is supported in such a manner that it is movable toward and away from the articles to control the application of propelling force to the article.

Means are provided to sense the presence of an article and in response to this, the position of the propelling member is shifted to either effect or halt the movement of articles along the conveyor. The sensing of the articles may be done mechanically or by other means which generates a signal, such for example as interruption of a light beam or the tripping of an electrical switch. Where the sensing is mechanical, the weight of the article is normally utilized as the energy source for effecting the physical movement of the propelling member. When other means are used to sense the articles, an auxiliary power source such as a motor, air cylinder, or solenoid has been provided to effect movement of the propelling member. These auxiliary power sources are expensive and require an available source of energy such as electricity or compressed air.

In those applications utilizing the weight of the article as the energy source, there is a conflict of purpose between the sensors and the actuation propelling member supporting units. If the articles are of reasonably uniform size and weight, the problem does not occur. Where, however, articles of widely varying size and weight are conveyed, the force required to support the propelling member in an article propelling position must be such as to assure movement of the heavier and more bulky articles. Since the sensing units must mechanically shift the propelling member from this position, this force must be supplied entirely by the weight of the article actuating the sensing unit. In the case of small or lightweight articles, it has been found that this force may exceed that which the article can supply with the result that the lighter articles fail to actuate the sensing unit and may become hung-up on the sensing units. In some cases, where only very lightweight articles are involved, the articles are incapable of shifting even the weight of the sensing unit itself.

This invention overcomes these problems by providing a means by which the power of the propelling member itself is utilized to effect the shifting of the propelling member between propelling and non-propelling positions. The sensing units are freed of the necessity of providing this force and can be designed to

operate with very light pressures. Thus, they are sensitive and can be made to operate with small, lightweight articles.

In one of its embodiments, this invention provides a means of utilizing the available power in the propelling member eliminating the necessity of providing auxiliary power sources. This reduces bulk and weight. It also reduces the initial cost and subsequent maintenance of the equipment. All of these are important advantages stemming from this invention.

These and other objects and advantages of this invention will be immediately understood by those acquainted with the design and use of conveyors upon reading the following specification and accompanying drawings.

In the drawings:

FIG. 1 is a fragmentary, plan view of a conveyor equipped with this invention;

FIG. 2 is a sectional elevation view taken along the plane II—II of FIG. 1;

FIG. 3 is a perspective view illustrating the actuator mechanism of the invention;

FIG. 4 is a side view of the actuator shown in FIG. 3, illustrating its operative engagement with the propelling member;

FIG. 5 is a view taken along plane V—V of FIG. 4;

FIGS. 6, 7, and 8 are all sectional elevational views showing the actuator mechanism of FIGS. 3, 4, and 5 in progressive stages as it passes through an operating cycle;

FIG. 9 is a fragmentary plan view of a second embodiment of a conveyor equipped with this invention;

FIG. 10 is a sectional elevational view taken along plane X—X of FIG. 9; and

FIG. 11 is a cross-sectional view taken along plane XI—XI of FIG. 2.

In executing the objects and purposes of this invention, there is provided a conveyor having a power driven endless propelling member. This propelling member may be utilized in a conveyor of a type such that it is flanked on each side by article supporting conveyor wheels which support a portion of the weight of the article, or it may be used in a power roll conveyor in which the articles are transported on rollers which in turn are driven from beneath by the propelling member. In either case, the upper run of the propelling member rests upon vertically movable supports, thereby permitting the propelling member to be shifted from an article propelling position to a retracted position in which it is disengaged from either the articles or the propelling rollers.

A plurality of supports connected together by means of linkages are controlled by actuators which are engaged by the lower run of the propelling member. The propelling member is equipped with cam-like surfaces along its length to engage the lower surface of the actuator. Sensors, responsive to the presence of an article on the conveyor, provide an input to the actuators which pivot with the cam surface to shift the support thereby moving the propelled member to a non-propelling position in selected areas along the conveyor's surface.

Referring now to the drawings, and specifically to FIGS. 1 and 2, a conveyor 10 of conventional construction is illustrated. The conveyor has a pair of side rails

or frame members 12 and 14 connected by a plurality of axles 16. Rotatably mounted on the axles at suitable spacings are article supporting wheels 18. The wheels 18 form an article supporting and conveying surface.

Paralleling the frame members 12 and 14 and spaced inwardly of them are a pair of parallel reinforcing straps 20. Mounted at the center of the conveyor is an endless propelling member or belt 22. The direction of movement of the propelling member is indicated by the arrows indicated in FIG. 2. It will be recognized that the propelling member passes over terminal pulleys at each end of each run and has some type of conventional power equipment to drive it. This equipment is not illustrated inasmuch as it is conventional and many types of equipment are available for this purpose.

The medial lane formed by the parallel straps 20 is flanked on each side by a low friction conveyor track generally designated by the numeral 32. The article supporting surfaces of the tracks 32 are formed by the conveyor wheels 18 mounted for free rotation on the axle 16. The wheels 18 are arranged in a pattern suitable for properly supporting articles moving along the conveyor bed. The particular pattern of wheels chosen for the illustrated conveyor is not particularly material to the invention since the pattern may be changed to suit the articles for which the conveyor is to be used. The article supporting surfaces formed by the conveyor wheels 18 are preferably slightly below the plane of the top surface of the propelling member 22 when the propelling member is in its operating or elevated position.

The upper run of propelling member 22 is supported by a plurality of spaced support wheels 24. The wheels 24 are mounted for rotation on support hangers 26 which, in turn, are pivotally mounted on selected ones of the axles 16 by means of an integrally formed axle hook 27. While it is not absolutely essential to the practice of this invention, it is preferable that the spacing between these support hangers be uniform. The hangers are connected together in groups for simultaneous operation by mechanical linkage members 28.

The hangers are pivoted downwardly to lower the propelling member 22. This action is governed by actuating members 30 located at periodic intervals along the conveyor 10. The actuating members 30 are "set" or "conditioned" by sensing members 34 which have a portion projecting above the conveyor surface which is depressed by articles passing over it. The structure thus far described is fairly conventional and in somewhat modified form is illustrated and disclosed in each of the above-mentioned prior United States patents.

In the particular structures described in this disclosure, mechanisms are utilized which transmit the information provided by the sensing unit 34 and execute the actual shifting of the support hangers 26 through the actuating member 30. These mechanisms are the subject matter of this invention.

Referring now to FIG. 3, the support hangers 26 and the actuating mechanism 30 will be described in detail. Each of the hanger supports is provided with an axle engaging hook 27 at its upper end designed to seat over the axle so that the hanger depends from and is freely pivotable about the axle. The lower end of the support hanger 26 is equipped with a link hook 34 similar in construction to that of the axle hook 27, but projecting

in the opposite direction. Projecting outwardly from the main body of the support hanger in the direction opposite to that of the axle hook 27, are a pair of laterally spaced arms 36 each having an upstanding ear 38. The upper ends of the ears are connected by a shaft 40 on which is mounted a pair of freely rotatable conveyor wheels 42. The wheels may be held in selected spaced relationship by any suitable means such as by a tubular collar seated about the shaft between the wheels.

Spaced, selected ones of the support hangers 26 are provided with an actuator mechanism 30 which is connected to the sensor 34. The actuating mechanism 30 has a pair of spaced apart side walls 46 bent outwardly forming a flange 48 which is adapted for mounting on selected ones of the support hangers 26 by conventional fastening means 28. Referring additionally to FIGS. 4 and 5, the side walls 46 are shown to extend some distance below the support hanger 26 and support at their lower end in an elongated slot 50 a vertically movable axle 52 on which is mounted a pair of latching wheels 54.

As illustrated, upper pressure wheels 42 are adapted to contact the lower surface of the upper run of the propelling member 22 on each side of the central rib 56. The latching wheels are in engagement with the ribbed portion 50 in the center of the lower run 22a of the propelling member.

Connected to the vertically movable axle 52 and movable therewith is a channel-shaped follower or lock member 58 extending upwardly within the confines of the side walls 46 of the actuator member 30. The lock member 58 has an upwardly extending back portion 60 which in a first position or erected rests against the axle 40 of the support hanger wheels 42 (FIG. 4). The side edges of the back portion extend forwardly to form the side walls 62 of the channel. The upper surfaces of the side walls form cam surfaces 64 to support the axle 40 when it is in its erected position. An opening is centrally provided in the back portion of the lock member 58 and supports a sensor link mechanism 66 which is operatively connected to the sensor 34 (FIG. 2).

Referring again to FIGS. 1 and 2, the sensor 34 is of a construction similar to that previously described in connection with the support hanger 26. The basic difference, however, is that the wheels 68 mounted thereon are spaced apart such that they extend on either side of the propelling member 22. In a first operating position they are pivoted forward so as to extend slightly above the propelling member 22 and the conveyor wheels 18. A link 70 forming a portion of the sensor linkage mechanism 66 is connected to the sensor and extends through the central opening in the back of the lock member 58 (See FIGS. 6, 7, and 8). Referring again to FIG. 4, the link 70 is shown to pass through the lock member 58 and a pair of collars 72 are fixed thereon to define the limit of travel of the link within the opening. A compression spring 74 is provided between the collars bearing on the lock member so that collar 72 is held against the back of the lock member. A tension spring 76 connected to the link 70 is fixed to an adjacent axle 16 of the conveyor. The two bias springs 74 and 76 need only provide a biasing force sufficient to hold the sensor 34 in its raised, forward or sensing position (FIG. 2).

The propelling member 22 is supported on the wheels 42 and is provided with an inner facing center guide rib 56. As previously described, the guide rib 56 contacts the latching wheel 54 at the lower portion of the actuator 30. At equally spaced intervals along the inner face of the belt, the rib 56 is provided with a skive or surface 78 (FIG. 2). As the belt moves, the latching wheel 54 acts as a cam follower, riding on and following the guide rib 56 moving vertically into and out of the skive or cam 78 whenever it passes beneath it. As the latching wheel moves vertically up and down following the rib surface, a corresponding movement occurs in the lock member 58 because of the connection through axle 52. This is a pulsating movement occurring each time the skive passes under the latching wheel. In a normal or transport position, that is, with the support hangers 26 biased forwardly, little vertical motion of the follower is transmitted to the belt as the lock member 58, wheel 54, and axle 52 are free to move vertically since the slot 50 provides a lost motion connection and the shaft 40 is at or above the upper limit of travel of the cam surfaces 64.

OPERATION

A complete operational cycle of the actuating mechanism is illustrated in detail in FIGS. 6, 7, and 8. Referring first to FIG. 6, the latching wheel or cam follower 54 is shown at its lowermost position within the cam surface 78 formed in the rib 56. The hanger support 26 and the support wheels are normally held in a forward biased or belt support position by the cam surface 64 against the axle 40. The lock member has momentarily moved downwardly with the cam follower 54 but will immediately rise into propelling position. As will be explained hereinafter, this is of no consequence. The connecting linkage 28 connects the hanger 26 to all other hangers 26 forming a single operating group, pulling them all into belt supporting position.

FIG. 7 illustrates the latch wheel 54 riding on the upper portion of the rib 56 just prior to its engagement with the skive or cam 78. The lock member 58 has been moved vertically upwardly by wheel 54 riding on the rib 56. The cam surfaces 64 are shifted into contact with or immediately below the axle 40. In the position shown in FIG. 7, an object on a conveyor has contacted the sensor 34 (FIG. 2), moving it downwardly. This has shifted the linkage rod 70 within the opening in the channel member 60 (to the left as viewed in FIG. 7). By comparing the illustrations in FIGS. 6 and 7, it will be seen that in FIG. 6 the collar 72 on linkage rod 70 restrains movement of the lock, whereas in FIG. 7, the shift of the rod 70 has removed this restraint. At this point the actuator 30, in response to actuation or movement of the sensor has been "conditioned" or "set" to allow the support hangers and support wheels to pivot downwardly to lower the propelling member when the next cam surface passes beneath the latching wheel 54.

This action is illustrated in FIG. 8 wherein the latching wheel 54 has dropped into the cam surface 78. As the wheel moves downwardly, the top of lock member 58 including the cam surfaces 64 pivots from beneath the axle 40 to a retracted position. Its pivotal movement is limited by the collar 72. The removal of the cam surfaces 64 from beneath the axle 40 frees the

hanger support 26 to pivot downwardly around the axle 27. A stop means 77 positioned transversely of the conveyor adjacent the hanger 26 engages the laterally extending arms 36 on the support hanger to prevent complete disengagement of the pressure wheels from the propelling member. When in a non-propelling position, the pressure wheels 42 operate as idler wheels to support the propelling means for free movement. All of the interconnected hanger supports forming an operating group are simultaneously pivoted downwardly lowering that portion of the conveyor belt 22 supported by these hangers to a non-propelling position, i.e., lowered below the plane of the surface of the conveyor wheels 18.

As the lower run of the belt 22a and the rib continues its travel, the latching wheel 54 is free to follow the surface of the rib 56 out of the skive 78. As illustrated by the dotted lines, the vertical pulsating action of the lock member 58 continues as the wheel 54 enters and leaves each passing skive. Since lock member 58 is retracted and does not contact the axle 40, the upper run of the belt remains in a non-propelling position. As long as an article remains on the sensor 34, articles will accumulate on the conveyor. When the article is removed from the sensor 34, spring 76 will bias the sensor into a raised sensing position.

So long as the lock member 58 continues to ride on the rib 56, interference between the axle 40 and the channel member will prevent the lock member from assuming its vertical position. This in turn will prevent the rod 70 from shifting to its normal position and the sensor from assuming its raised position. Upon arrival of the next skive, the lock member 58 will drop, permitting the cam surfaces 64 to pass under the axle 40. The lock member then assumes its normal vertical position, the rod 70 shifts to its normal position and the sensor shifts to erected position. However, the hanger 26 will remain in lowered position until the end of the skive is reached. This will force the lock member upwardly. Since the cam surfaces 64 are now beneath the axle 40, the hanger 26 will be pivoted into erected position, raising the propelling member and restoring transport of the articles.

It will be recognized that there will be a delay between actuation of a sensor, and the shifting of the belt position either to accumulate or to transport. The length of this delay will be determined by the spacing between skives. Normally, a number of skives will be provided at some suitable, uniform spacing such as three or five feet. As belt speed is increased the spacing may increase. The length of each skive can be varied and will also depend in part upon the speed of operation of the belt. The higher the speed, the longer the skive to account for inertia of the mechanical assemblies it operates. Normally, one to two feet will be satisfactory.

During normal propelling conditions, it is recognized that as the latch wheel 54 drops into a skive 78 at predetermined intervals, the downward travel of the lock member will allow the belt to momentarily assume a non-propelling position. This is, however, of no consequence as normal movement and inertia of the packages will continue their normal movement during the brief interval incident to the passage of a skive. Similarly, as articles pass over the sensor during normal

transport operation, because of the dwell between actuation of the sensor and the actual lowering of the belt incident to the spacing of the cam surfaces or skives 78 will prevent the packages from accumulating. However, when a gate mechanism 80 or similar positive stop means is moved into position to prevent movement of the articles off the sensor this dwell will be overcome and accumulation will occur.

The gate mechanism 80 provides a positive stop as shown in FIG. 2 and may be operated by a conventional air or hydraulic cylinder 82. In some applications, it is desirable to control the lead sensor and actuator mechanism in response to the closing of the gate. A modification to accomplish this function is illustrated in FIG. 11 wherein a solenoid 84 is shown having its movable element 86 connected to the member 58 in the same manner as that described in connection with the link 70. The solenoid may be energized by means of a switch 88 (FIG. 2) operatively associated with the movable gate 80.

FIGS. 9 and 10 illustrate the application of the invention to a conveyor of the type having powered transport rollers. In this type of conveyor, the belt 22, in a driving position engages the lower surface of the transport rollers 90 and is supported in driving position by pressure rollers. The construction of the pressure rollers or wheels and hanger supports is essentially the same as that previously described in connection with the embodiment shown in FIGS. 1 and 2. The essential difference in the application of the invention to this type of conveyor resides in the necessity of providing a sensor which is located above the level of the transport rollers. This is readily accomplished by providing an extended arm 92 on the sensor support hanger 94 to hold the sensor wheel 96 above the level of the transport rollers. The operation of the sensor, actuator 30, and pressure roller assembly 26 remains identical.

In both of the embodiments shown, the actuator mechanism 30 is "set" or "conditioned" by movement of the sensor by an article on the conveyor. No spring biasing force is required to move the pressure rollers and the propelling member between propelling and non-propelling positions as this is accomplished mechanically through movement of the lock member 58 within the actuator 30. The only biasing force required in the system is that provided by bias spring 76 to return the sensor 34 to an upright, operative position, and that bias force may be just sufficient to raise the sensor. Obviously with such minimal bias force on the sensor, an article of minimal weight will be sufficient to trigger the actuator 30. In so doing it provides conveyors with a greater range of capacity, particularly in handling articles of widely varying sizes and weights. Thus, it increases the range of activities to which a particular conveyor can be applied. It additionally permits a fewer number of standardized conveyor constructions to be used to meet the requirements of most users. Additionally, this invention permits substantial lengths of conveyors to be handled simultaneously because the energy requirement imposed upon the sensing unit is not proportional to the energy required for support of the propelling member to assure efficient transportation of the articles.

While this invention will permit a single sensor to operate a substantial number of the hangers 26, since

the energy required to actuate a sensor remains the same irrespective of the number of hangers it controls, in most accumulators it is necessary that the conveyor be arranged in a plurality of zones or sections. These sections are arranged in tandem, each having its own sensor and a group of the hangers 26. Each section operates independently of adjacent sections. The sensor for each section is located in the section ahead or downstream of it so that the section responds not to the conditions in the section but to the conditions existing in the section ahead. The length of each section will be governed by the results desired. Normally it is designed to accommodate one article being transported at a predetermined space from adjacent articles on the conveyor.

While several embodiments of the principles of this invention have been illustrated and described, it will be recognized that other embodiments and modifications of this invention, all of which incorporate the principles thereof may readily be made in light of this disclosure. All of these modifications embodying the principles of this invention are to be considered as included in the appended claims unless these claims expressly state otherwise.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An accumulator conveyor having a driven propelling member and vertically movable means for supporting said propelling member in each of two positions, a first article propelling position and a second article non-propelling position, an article actuated sensor connected to said supporting means, said conveyor characterized by a locking member movable between an erected position locking said supporting means in said first position and a retracted position disengaged from said supporting means, said support means automatically shifting to said second position when said supporting means is retracted; said sensor when non-activated biasing said locking member into erected position, said sensor when activated biasing said locking member toward retracted position; a rib on said propelling member having a cam portion therein, a cam follower on said locking member; said rib supporting said locking member in erected position both when said sensor is activated and non-activated; said cam follower shifting said locking member to retracted position when said sensor is also activated and returning said locking member to erected position when said sensor again becomes non-activated.

2. An accumulator conveyor as described in claim 1 wherein said locking member is supported by said rib and said supporting means and the portion of said propelling member above said supporting means is supported by said locking member; said locking member, when shifted by said cam portion from retracted to erected position, lifting said support means and the propelling member into article propelling position as said cam follower travels from said cam portion onto said rib.

3. An accumulator conveyor as described in claim 1 wherein means mount said sensor for movement to non-activated position wherein it is extended and its activated position wherein it is retracted; a rod connecting said sensor to said locking member and a lost mo-

tion connection between said rod and locking member; a first spring biasing both said sensor and said locking member into erected position; a second spring for applying a bias to said locking member urging said locking member into retracted position when said sensor is moved to retracted position.

4. In a conveyor for articles having an endless driven article propelling member, said propelling member having a forward run and a return run; means for shifting said propelling member between an article propelling and an article non-propelling position; and a sensor to detect the presence of an article on said conveyor, the improvement comprising: at least one portion of said propelling member having a cam surface; a cam follower engaging and vertically movable by said cam surface and means connecting said cam follower to said shifting means, said connecting means in response to an input signal from said sensor alternately engaging or disengaging said cam follower and said shifting means, said cam follower when engaged to said shifting means transmitting its vertical motion to said shifting means.

5. In a conveyor for articles having an endless driven article-propelling member, said propelling member having a forward run and return run; means for shifting said propelling member between an article-propelling and an article-nonpropelling position; and a sensor to detect the presence of an article on said conveyor, the improvement comprising: a cam surface on said propelling member; a cam follower engaging said cam surface, said cam follower being operatively connected to said shifting means to cause same to shift said propelling member between said positions; means connecting said cam follower to said sensor, said cam follower movable by said cam surface between engaging and nonengaging position with said shifting means, said sensor normally holding said cam follower in an engaging position with said shifting means, said sensor upon detection of an article on said conveyor movable to a retracted position to thereby allow said cam follower to move to a nonengaging position with said shifting means whereby said shifting means shifts said propelling member into article-nonpropelling position.

6. In a conveyor for articles having an endless driven article propelling member, said propelling member having a forward run and return run; a support element for said forward run, said support element being shiftable to move said propelling member between article propelling and article non-propelling positions; a member biasing said support into an article propelling position, said biasing member extending downwardly for engagement with said lower run of said propelling member; a cam surface on said propelling member for periodic engagement with said biasing member; a sensor on said conveyor to detect the presence of an article on said conveyor, said sensor connected to said biasing member, said biasing member being shiftable to remove the bias from said support element in response to movement of said sensor; said cam surface on said propelling member acting through said biasing member

to move said support member and said propelling member into an article non-propelling position.

7. A conveyor as described in claim 6 wherein said propelling member has a depending central rib portion, and said cam surface is formed in said central rib.

8. A conveyor as described in claim 7 wherein said biasing member is a cam follower, adapted to ride on said rib and movable into said cam surface.

9. A conveyor as described in claim 6 wherein said sensor holds said biasing member into an engaging position with said support element, said sensor movable to a non-holding position with respect to said biasing member in the presence of articles on said conveyor.

10. In a conveyor for articles having an endless driven article propelling member, said propelling member having a forward run and a return run; a support element for said forward run, said support element being movable to shift said propelling member from an article propelling position to an article non-propelling position; actuator means engagable with said support element for moving said support element between said positions; a cam surface on said propelling member, said cam surface operably engaging said actuator means for moving said actuator between engaging and non-engaging positions with said support element; a sensing element for detecting articles on said conveyor; means connecting said sensing element to said actuator element holding said actuator in an engaging position with said support element in the absence of articles and movable to a non-holding position in the presence of articles; said actuator movable to a non-engaging position by said cam surface when said sensor is moved to a non-holding position by an article detected by said sensor to allow said support element and said propelling member to move to a non-propelling position.

11. In a conveyor for transporting articles, said conveyor having a driven propelling member for moving articles along said conveyor; supporting elements for said propelling member, said supporting elements being movable for shifting said propelling member into article propelling and article non-propelling positions; actuator means for moving said supporting elements from one of said positions to the other, said actuator means having a lock member engaging said propelling member; a cam member on said propelling member periodically engaging said lock member; said actuator means engaging said support element when said propelling member is in an article propelling position and shiftable to a non-engaging position to allow said supporting element and said propelling member to move to an article non-propelling position; a sensor responsive to articles moving on said conveyor; means connecting said sensor to said lock member to hold said lock member in a support engaging position, movement of said sensor by articles on said conveyor conditioning said lock member to be responsive to said cam member on said propelling means to move said lock member into a non-engaging position with respect to said support elements.

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