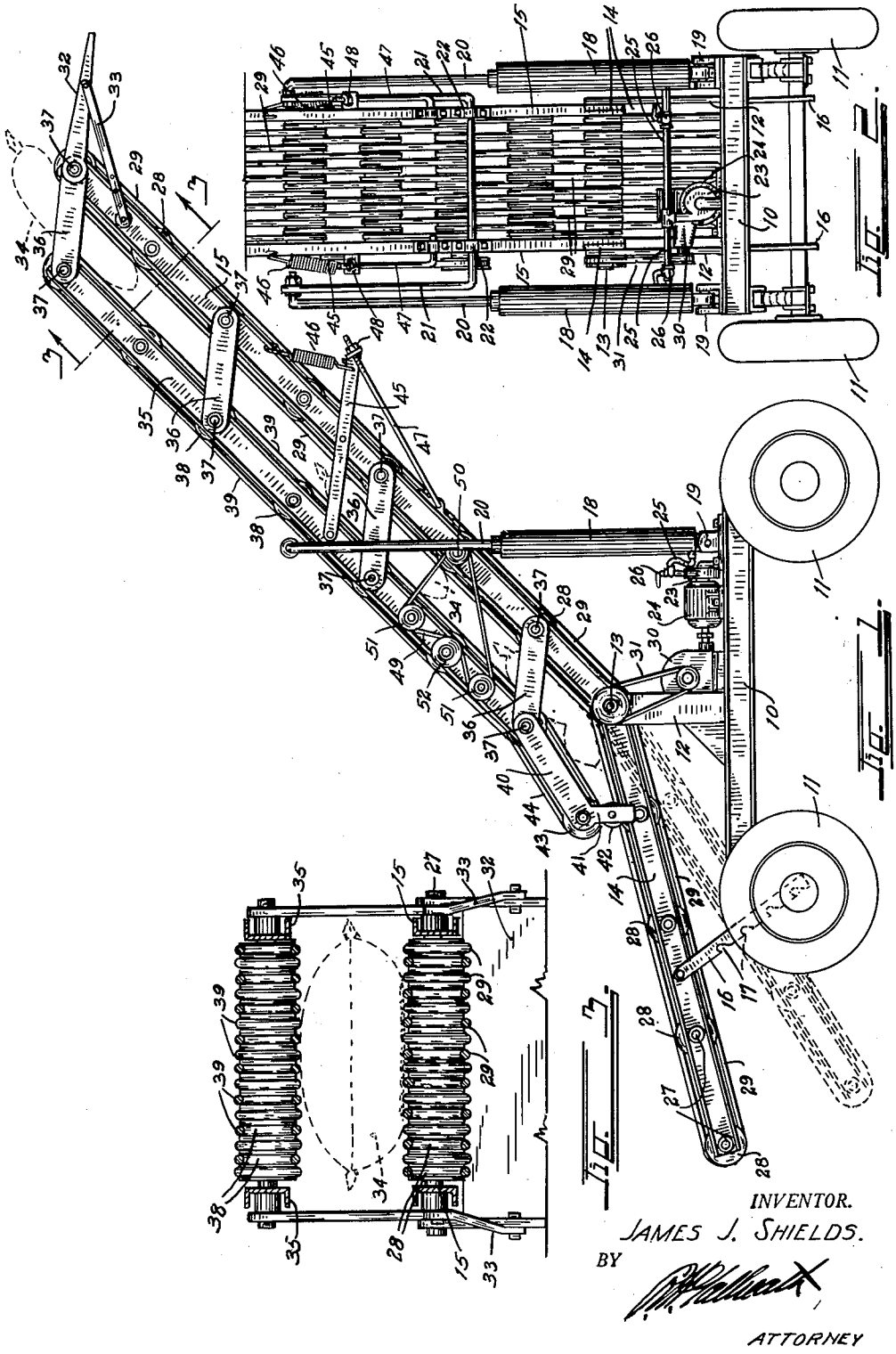
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ELEVATING CONVEYER

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ELEVATING CONVEYER

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This invention relates to a portable conveying and stacking device for use in warehouses and the like, and is more particularly designed for use on sacked materials, such as flour, sugar, etc.

The principal object of the invention is to provide an easily portable conveying and elevating device which can be adjusted to receive sacks at any desired position and height, and which can be quickly and easily regulated to deliver the sacks either horizontally or up an incline to any desired height.

Another object of the invention is to so construct the device that, when adjusted to a relatively steep incline, the sacks will be gripped while being elevated so as to prevent them from sliding back down the incline, and to provide a sack-gripping means which will not injure or damage the sacks, and which will automatically accommodate sacks of differing sizes, shapes, etc.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention, reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:

Fig. 1 is a side view of the improved conveying and stacking device;

Fig. 2 is a front view thereof, with the upper portion broken away; and

Fig. 3 is an enlarged, fragmentary, detail section, taken on the line 3—3, Fig. 1.

The improved portable conveying and stacking device employs a chassis 10 mounted upon suitable wheels 11. An upstanding frame 12 on the chassis supports a cross shaft 13 thereabove.

A lower conveyor frame 14 and an upper elevator frame 15 are hingedly mounted at their adjacent extremities on the cross shaft 13 so that they may be swung thereabout. The rearward extremity of the conveyor frame 14 is supported upon adjustable braces 16 which can be adjusted to raise and lower the frame 14 to any desired height and angle, as indicated in broken line in Fig. 1. The braces 16 may have any desired construction. As illustrated, they are provided with a plurality of notches 17 which selectively engage an axle of one pair of the wheels 11.

The upper elevator frame 15 is supported from hydraulic cylinders 18 hingedly mounted at 19

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on the chassis 10. A piston rod 20 projects upwardly from each of the cylinders 18. A U-shaped suspension yoke 21 is hingedly suspended from the upper extremities of the piston rods 20 and extends through bearing brackets 22 beneath the frame 15.

Hydraulic fluid is supplied to the cylinders 18 from a suitable pressure pump 23 driven from an electric motor 24 through hydraulic pipes 25 and conventional control valves 26.

It can be readily seen that, if the fluid is allowed to discharge from the cylinders 18, the frame 15 can be lowered to a substantially horizontal position, and if the fluid is forced under pressure into these cylinders, the frame 15 will be elevated to any desired incline, such as shown in Fig. 1.

Both frames are provided with a plurality of roller shafts 27, upon each of which a multiple-grooved roller 28 is mounted. A plurality of endless belts 29 extend between the rollers 28. Each belt surrounds two of the rollers, the belts being staggered so that from one roller each alternate belt will extend to the right, with each intermediate belt extending to the left. This provides a continuous surface of belts throughout the length of the frames 14 and 15.

The roller on the cross shaft 13 is fixed thereto, and this shaft is driven from the motor 24 through a suitable speed reducer 30 and drive belt 31 to impart movement to all of the belts.

The frame 15 terminates at its far extremity in a delivery platform or chute 32, the angle of which can be adjusted by means of adjustable braces 33.

It can be readily seen that, if sacks, such as indicated in broken line at 34, or other articles, are placed upon the belts of the frame 14, they will be carried forwardly and delivered onto the belts of the frame 15. The latter belts will carry the sacks to the extremity of the frame 15 and deposit them on the delivery chute or platform 32.

The device as thus far described will be useful for installations and uses where a relatively steep incline of the frame 15 is not required. For stacking purposes, however, means are provided for preventing the sacks from slipping downwardly on the belts 29 of the frame 15. This is accomplished by mounting a press frame 35 over and parallel to the frame 15. The press frame 35 is supported upon hinged parallel links 36 so that it can be moved toward or away from the frame 15, but will always remain parallel thereto.

The press frame **35** is provided with roller shafts **37**, grooved rollers **38**, and endless belts **39**, similar to the shafts **27**, rollers **28**, and belts **29** previously described. A hinged frame **40** is hingedly mounted on the lowermost roller **37** of the frame **35** and is supported at its lower extremity upon legs **41**, which are in turn supported upon supporting rollers **42** which ride upon the frame **15**. The frame **40** supports a terminal belt roller **43**, from which a series of endless belts **44** extend to the lowermost belt roller **38** of the frame **35**.

The separation of the two frames **15** and **35** is controlled by means of connecting levers **45**, there being one lever on each side of the two frames **15** and **35** pivotally connected to both and extending parallel to the links **36**. The levers **45** are constantly urged by means of springs **46** to cause the frame **35** to approach the frame **15**. The minimum spacing is regulated by means of stop rods **47** having adjustable stop nuts **48** which limit the arc of movement of the levers **45**.

The belts **39** are driven through the medium of a transmission belt **49** which extends from a drive pulley **50** over idler pulleys **51** on the frame **35** and about a driven pulley **52** mounted on one of the shafts **37**. It can be seen that, if the rollers **28** are rotating to the right, the belt **49** will drive the rollers **38** to the left, so that all belts in contact with the sacks move in the same direction.

In use, the sacks are placed upon the belts **29** of the frame **14** and are carried beneath the terminal roller **43**, which swings upwardly and rides over the sacks under the influence of gravity. This roller forces the sacks between the series of rollers **28** and **38**, and between the belts **29** and **39**, so as to lift the frame **35**. Since the belts in contact with the sacks are moving at the same speed and in the same direction, they will grip the sacks and elevate them upwardly at any desired angle. The terminal roller **43** follows the positions of the frame **14** and remains uniformly spaced therefrom at all angles of the frames.

The belts may be of any suitable type. One desirable type is illustrated in applicant's prior Patent No. 2,260,587.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:

1. An elevating and conveying device comprising: a cross shaft; an upper elevating frame hingedly mounted at its lower extremity on said cross shaft; a lower conveying frame hingedly mounted at its upper extremity on said cross shaft; means for raising and lowering the free extremities of said two frames; conveying belts extending throughout the length of both frames; means for driving said belts; a press frame positioned parallel to said elevating frame; parallel connecting links extending between said press frame and said elevating frame and being hinged to both; conveying means supported by said press frame; means for driving said conveying means in unison with, and in opposite direction to, the first conveying belts; a hinged frame extending from and being hinged to the lower extremity of the press frame; conveying means mounted on said hinged frame; and means for supporting the free extremity of said hinged frame from said lower conveying frame so that the latter two frames will move in unison.

2. An elevating and conveying device comprising: a cross shaft; an upper elevating frame hingedly mounted at its lower extremity on said cross shaft; a lower conveying frame hingedly mounted at its upper extremity on said cross shaft; means for raising and lowering the free extremities of said two frames; conveying belts extending throughout the length of both frames; means for driving said belts; a press frame positioned parallel to said elevating frame; parallel connecting links extending between said press frame and said elevating frame and being hinged to both; conveying means supported by said press frame; means for driving said conveying means in unison with, and in opposite direction to, the first conveying belts; a hinged frame extending from and being hinged to the lower extremity of the press frame; conveying means mounted on said hinged frame; legs extending from said hinged frame; and rollers supporting said legs from said lower conveyor frame.

3. An elevating and conveying device comprising: a cross shaft; an upper elevating frame hingedly mounted at its lower extremity on said cross shaft; a lower conveying frame hingedly mounted at its upper extremity on said cross shaft; means for raising and lowering the free extremities of said two frames; conveying belts extending throughout the length of both frames; means for driving said belts; a press frame positioned parallel to and above said elevating frame; parallel connecting links extending between said press frame and said elevating frame and being hinged to both; conveying means supported by said press frame; means for driving said conveying means in unison with, and in opposite direction to, the first conveying belts; a connecting lever pivotally secured to both said elevating and said press frames and extending below said elevating frame; a stop rod extending from said elevating frame and slidably engaging the extending-below portion of said connecting lever; and stop means on said rod to limit the swing of said lever so as to limit the approach of said press frame toward said elevating frame.

4. An elevating and conveying device comprising: a cross shaft; an upper elevating frame hingedly mounted at its lower extremity on said cross shaft; a lower conveying frame hingedly mounted at its upper extremity on said cross shaft; means for raising and lowering the free extremities of said two frames; conveying belts extending throughout the length of both frames; means for driving said belts; a press frame positioned parallel to and above said elevating frame; parallel connecting links extending between said press frame and said elevating frame and being hinged to both; conveying means supported by said press frame; means for driving said conveying means in unison with, and in opposite direction to, the first conveying belts; a connecting lever pivotally secured to both said elevating and said press frames and extending below said elevating frame; a spring tensioned between the extending-below portion of said lever and said elevating frame and acting to cause said lever to urge said press frame toward said elevating frame; a stop rod extending from said elevating frame and slidably engaging the extending-below portion of said connecting lever; and stop means on said rod to limit the swing of said lever so as to limit the approach of said press frame toward said elevating frame.

5. In an elevating conveyor of the type having

an upper inclined conveyor hinged to a lower inclined conveyor, with a press conveyor maintained parallel to and over said upper inclined conveyor by means of hinged parallel links for pressing articles against said upper inclined conveyor, means for pressing said articles toward the hinged extremities of the upper inclined conveyor and the lower inclined conveyor, comprising: a frame hinged at its upper extremity to the lower extremity of said press conveyor and extending toward said lower inclined conveyor; an endless belt conveyor device supported in said frame and being driven from said upper conveyor; and legs extending from the lower extremity of said frame into contact with said lower conveyor to maintain a uniform spacing between said conveyor device and said lower conveyor at all times.

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