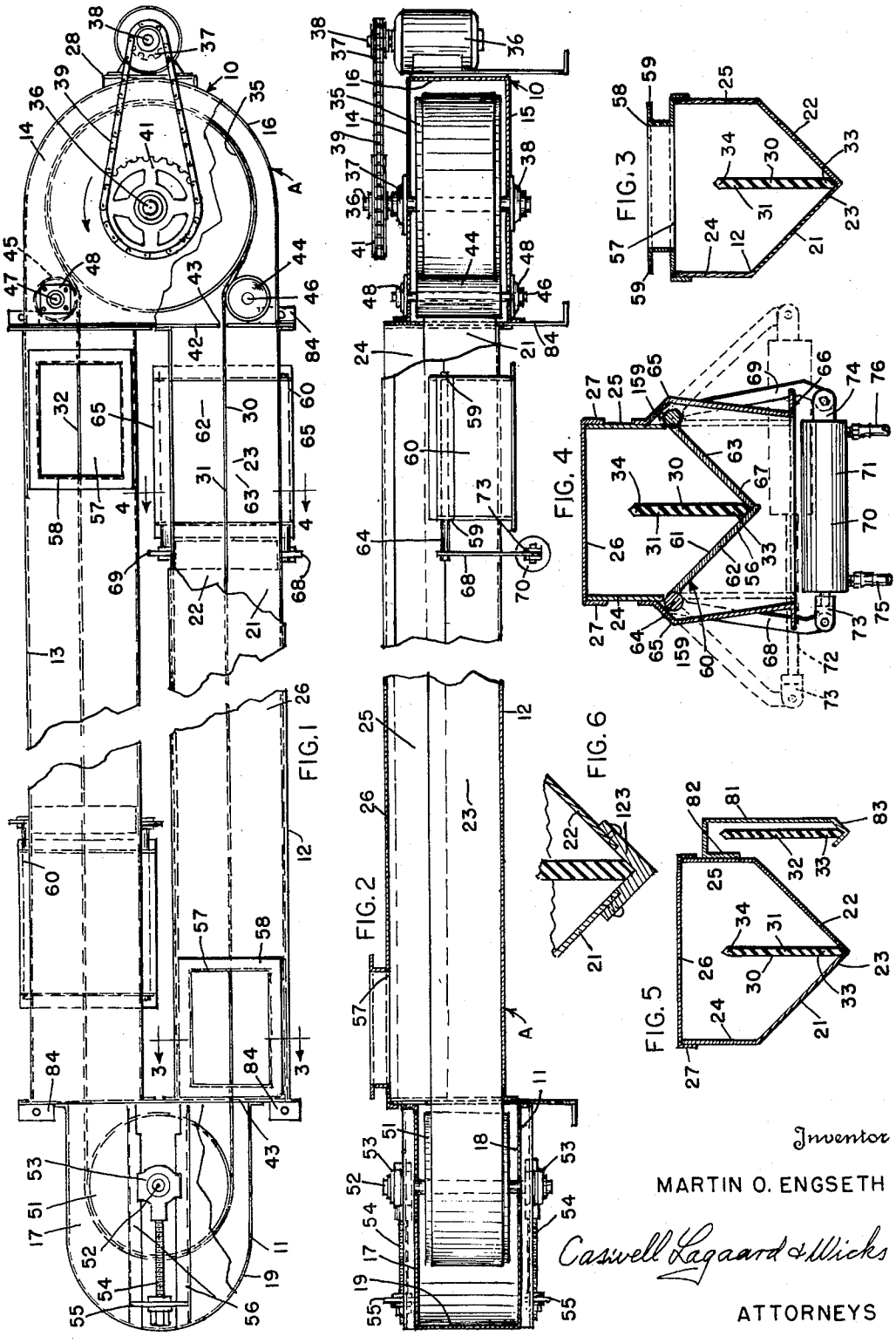
May 12, 1964 M. ENGSETH 3,132,738

CONVEYER

Filed April 10, 1961



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United States Patent Office 3,132,738 Patented May 12, 1964

3,132,738

CONVEYER

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Filed Apr. 10, 1961, Ser. No. 101,935
8 Claims. (Cl. 198—184)

The herein disclosed invention relates to conveyers for conveying granular material such as grain, sugar, etc., and has for an object to provide a conveyer adapted to handle large quantities of the material and one in which the material may be completely removed from the conveyer without the use of costly belt trippers or other special devices.

Another object of the invention resides in providing a conveyer which can convey material in both directions simultaneously.

A still further object of the invention resides in providing a conveyer which could be used with bottom discharge mechanism.

In carrying out the invention a V-shaped trough having converging inclined sides sloping downwardly and with means forming an elongated crotch therebetween is employed together with a belt having a substantially vertical run disposed in said trough and with its lowermost edge following along said crotch.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

FIG. 1 is a plan view of a conveyer illustrating an embodiment of the invention.

FIG. 2 is an elevational view of the structure shown in FIG. 1.

FIG. 3 is a cross-sectional view taken on line 3—3 of FIG. 1.

FIG. 4 is a cross-sectional view taken on line 4—4 of FIG. 1.

FIG. 5 is a cross-sectional view of a modification of the invention.

FIG. 6 is a cross-sectional view of still another form of the invention.

The invention is housed within housing A and which includes a head end case 10, a tail end case 11 and legs 12 and 13. The case 10 consists of a top 14, a bottom 15 and an arcuate wall 16 connected to said top and bottom. The case 11 is similar in construction and includes a top 17, a bottom 18, and an arcuate wall 19 connected thereto in the same manner as in the case 10.

The legs 12 and 13 are similar in construction, and only the leg 12 which is shown in detail in FIGS. 3 and 4 will be described. This leg is constructed of sheet metal to form two converging downwardly sloping sides 21 and 22 which meet at their lower edges to provide an elongated crotch 23. Crotch 23 is substantially V-shaped in form and forms a continuation of the V-shaped arranged sides 21 and 22. Extending upwardly from the sides 21 and 22 are vertical walls which are closed by means of a cover 26 overlying the upper ends of the same and formed with flanges 27 depending downwardly therefrom and secured to said walls in any suitable manner.

Operating within the housing A is an endless belt 30 arranged on edge and provided with two runs 31 and 32. Run 31 extends through the leg 12 and run 32 extends through the leg 13. The belt 30 is formed of canvas or some other suitable material which may be coated with a flexible coating, such as is now in common use. This belt has V-shaped edge portions 33 and 34, the edges 33 resting on and running along the crotch 23 of legs 12 and 13. At the ends of the legs 12 and 13 are end plates 42 which have slots 43 therein and through which the runs 31 and 32 of the belt 30 pass. Feet 84 attached

to these plates support the conveyer at the desired elevation.

The belt 30 passes about a pulley 35 disposed in case 10 and which is mounted on a shaft 36. Shaft 36 is journaled in bearings 37 and 38 attached to the top 14 and bottom 15 of case 10. The pulley 35 is driven from a motor 36 containing reduction gearing and which is mounted on a bracket 28 secured to the wall 16 of case 10. A sprocket wheel 37 is mounted on the shaft of motor 36. A chain 39 passes over this sprocket wheel and over another sprocket wheel 41 fast on the shaft 36. Pulley 35 is somewhat greater in diameter than the distance between the slots 43 of the end plates 42 of the legs 12 and 13 to give sufficient wrap of the belt about the same to produce sufficient traction to drive the belt. For guiding the belt into these slots, idler pulleys 44 and 45 are employed which are mounted on shafts 46 and 47, journaled in bearings 48 attached to the top 14 and bottom 15 of case 10.

The belt 30 also passes about a pulley 51, disposed in the case 11 and mounted on a shaft 52. This shaft is journaled in bearings 53 connected to two belt tighteners 54 operating between said bearings and brackets 55 attached to the top 17 and bottom 18 of the case 11. The bearings 53 are slidably mounted in guides 56 attached to said top and bottom as best shown in FIG. 1. Pulley 51 is of a diameter equal to the distance between the slots 43 of the end plates of the two legs 12 and 13 so that the runs 31 and 32 of the belt 30 pass freely through said slots.

It will thus be seen that the lower edge portions 33 of the belt 30 are supported by and run along the elongated crotches 23, and that the runs 31 and 32 thereof when within the legs 12 and 13 remain in a substantially vertical position. The arrangement shown in FIG. 1 permits the material to be conveyed in two directions simultaneously. When the pulley 35 is driven in the direction indicated by the arrow, the material travels to the right in leg 12 as viewed in FIG. 4, and to the left in leg 13.

At desired positions along the legs 12 and 13 and particularly at the ends thereon in which the runs of said belt enter legs 12 and 13, are provided inlet openings 57, best shown in FIG. 3. These openings are surrounded by fittings 58 and which have flanges 59 extending outwardly therefrom and to which suitable conduits or spouts may be connected for directing the material to be conveyed into the conveyer.

At desired localities along the legs 12 and 13 and particularly at the ends of said legs where the runs 31 and 32 leave the same are located discharge mechanisms 60. These mechanisms being identical, only the mechanism associated with the leg 12 will be described. This mechanism is best shown in FIG. 4. At the locality of said mechanism the portions of the sides 21 and 22 of the leg 12 are removed to provide a discharge opening 61 in the bottom of the leg. This opening is adapted to be closed by means of two gates 62 and 63. Enclosing the two gates 62 and 63 are cover plates 65 which are attached to the walls 24 and 25 of the said leg and which extend considerably below the crotch 23. These plates have outwardly extending flanges 66 and to which spouts or conduits may be attached for leading the material conveyed away from the conveyer. The gates 62 and 63 are attached at their upper edges to shafts 64 journaled in bearings 59 formed in the plates 65 and by means of which said gates are guided for swinging movement from the positions shown in full lines in said figure and to the dotted line positions. When in their full line positions, the opening 61 is closed and when in their dotted line position, the opening is fully open. The gates 62 and 63, when closed, form a crotch 56 lying in continuation of

the crotch 23 and along which the lower edge 33 of the belt 30 may travel, the same as along the crotch 23.

For the opening and closing the gates 62 and 63, arms 68 and 69 are attached to the shafts 64 and project outwardly therefrom. Beneath the run 12 is mounted a fluid operated cylinder-piston device 70 having a cylinder 71 and a piston rod 72 extending outwardly through an end of said cylinder and connected to a piston not shown. Arm 68 is connected by means of a connector 73 to the end of the piston rod 72 while arm 69 is pivotally connected to a lug 74 extending outwardly therefrom the opposite end of the cilynder. Conduits 75 and 76 lead to the opposite ends of the cylinder and when fluid under pressure is directed into the device, the said cylinder and piston travel relative to each other from the full line position to the dotted line position shown in FIG. 4 moving the gates 62 and 63 from closing position to opening position.

In FIG. 5 I have shown a modification of the invention in which the material will be conveyed in one direction only. The construction shown in FIG. 5 being similar to that shown in FIG. 1 the description thereof will not be repeated. The same reference numerals will, however, be used to designate the corresponding parts. In this form of the invention, the leg 13 is dispensed with and a guard 81 is used in place thereof. This guard is attached to the wall 25 of leg 12 by means of a depending flange 82 formed thereon. Guard 81 terminates in a crotch 83 at the lower most portion of the same and in which the lower edge 33 of the run 32 of the belt 30 travels.

In FIG. 6 has been shown a variation of the invention in which the crotch 123 is formed as a separate elongated strip of material which may be an extrusion or some other form of construction wherein greater thickness can be procured. The sides 21 and 22 fall short of one another and are attached to this crotch in a manner such that the inner surface of said crotch and the inner surfaces of said sides lie in continuation of one another. This construction takes up the wear resulting from the lower edge 33 of the belt engaging and traveling along the crotch and gives greater life to the conveyor.

The operation of the invention is as follows: When the material to be conveyed is deposited into the leg 12 through the inlet opening 57, the same slides downwardly along the sides 21 and 22 of said leg until it engages the belt 30. The runs of the belt through friction with the material being conveyed, convey the material until it is discharged through one of the discharge mechanisms 60. All of the material is caused to move throughout the operation of the conveyor so as to procure rapid conveying of the same. As the flow of material diminishes the material slides down the sides 21 and 22 and is immediately brought in contact with the belt 30 and conveyed by the same. In this manner all of the material in the legs of the conveyor is removed from the same.

The advantages of the invention are manifest. The conveyor will handle a large variety of material such as grains, ground feeds, seeds, flax, corn, soybeans, sugar, salt, spices, nuts, dry chemicals and in fact any free flowing material. The conveyor is self cleaning. No contamination of material in the gates and other parts of the conveyor since the material is completely removed from the conveyer. The conveyer is silent, there being no clatter of scrapers, flights, or chain. The conveyer can be constructed at a nominal expense. Wear of the parts is a minimum and the life of the conveyer is greatly increased over that of other conveyers now on the market. The conveyer embodying the instant invention uses a minimum amount of power.

Changes in the specific form of the invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of the invention.

Having described the invention, what is claimed as new and desired to be protected by Letters Patent is:

1. A conveyor for conveying granular materials comprising: a horizontal trough having converging elongated sides sloping downwardly and inwardly to define an elongated crotch, said trough supporting such granular materials to be conveyed and having a discharge opening in the lower portion thereof; closure means supported by said trough for closing said opening; guide means guiding said closure means between positions of closing said opening and being disposed away from said opening to permit discharge of such granular material through said opening; a flat continuous and unobstructed vertically extending belt having two continuous surfaces for frictionally engaging such granular materials, the lower edge of said belt being slidably supported by said elongated crotch and having its upper edge substantially centrally disposed between said sides of said trough, said converging sides and crotch cooperatively urging such granular material into engagement with both surfaces of said belt to continuously convey such granular material therealong to said discharge opening thereby imparting a positive and continuous moving action to such granular material when said belt is being driven; and driving means drivingly supporting said flat belt to move said belt through said trough past said discharge opening.

2. The invention as set forth in claim 1 wherein said closure means includes gate means overlying said opening and having surfaces lying substantially in continuation with the surfaces of the sides of the trough and with its lower edges meeting to form a crotch substantially continuous with the crotch of said trough.

3. The invention as set forth in claim 2 wherein said gate means is pivotally connected to said trough and guide means.

4. A conveyor for conveying granular materials comprising: a horizontal trough having converging elongated sides sloping downwardly and inwardly to define an elongated crotch, said trough supporting such granular materials to be conveyed; a flat continuous and unobstructed vertically extending belt having two continuous surfaces for frictionally engaging such granular materials, the lower edge of said belt being slidably supported by said elongated crotch and having its upper edge substantially centrally disposed between said sides of said trough, said converging sides and crotch cooperatively urging such granular material into engagement with both surfaces of said belt to continuously convey such granular material therealong thereby imparting a positive and continuous moving action to such granular material when said belt is being driven; and driving means drivingly supporting said flat belt to move said belt through said trough.

5. The invention as set forth in claim 4 wherein said trough, crotch, and lower edge of said belt are all substantially V-shaped and said belt extends vertically above said trough sides.

6. The invention as set forth in claim 4 wherein said lower edge of said belt conforms with the inner surface of said crotch.

7. A conveyor for conveying granular materials comprising: a horizontal trough having converging elongated sides sloping downwardly and inwardly; means at the lower most portions of said sides defining an elongated crotch, said means and said trough supporting such granular materials to be conveyed; a flat continuous and unobstructed vertically extending belt having two continuous surfaces for frictionally engaging such granular materials, the lower edge of said belt being slidably supported by said means defining an elongated crotch and having its upper edge substantially centrally disposed between said sides of said trough, said converging sides and said means defining said crotch cooperatively urging such granular material into engagement with both surfaces of said belt to continuously convey such granular material therealong thereby imparting a positive and continuous moving action to such granular material when said belt is being driven; and driving means drivingly supporting said flat belt to move said belt through said trough.

8. The invention as set forth in claim 7 wherein said trough sides slope downwardly and inwardly at substantially the same angle with a vertical and said means defining said elongated crotch having inner surfaces merging into the inner surfaces of said sides.

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