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CONVEYOR CONSTRUCTION

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3 Sheets-Sheet 1



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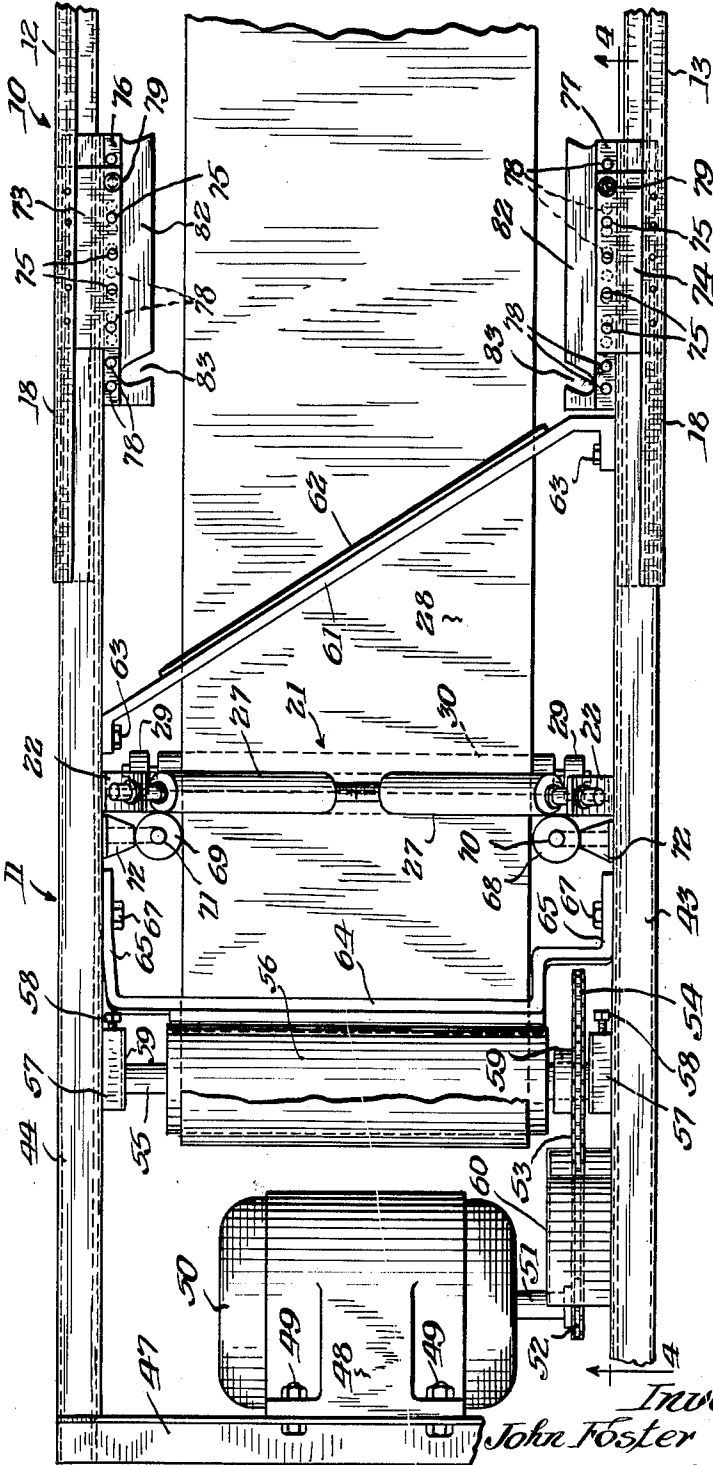
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3 Sheets-Sheet 2

Fig. 3.



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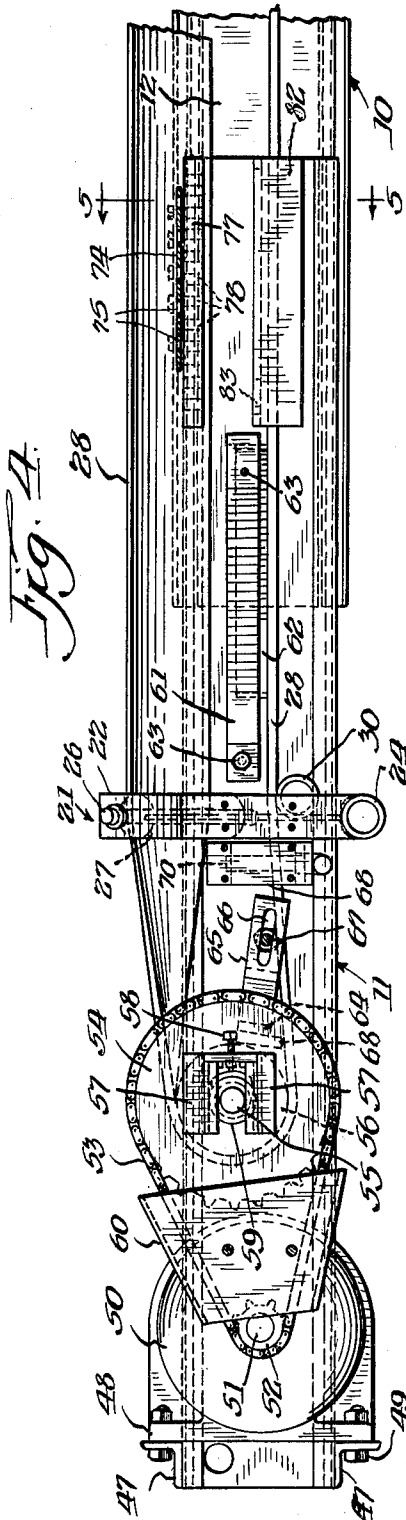
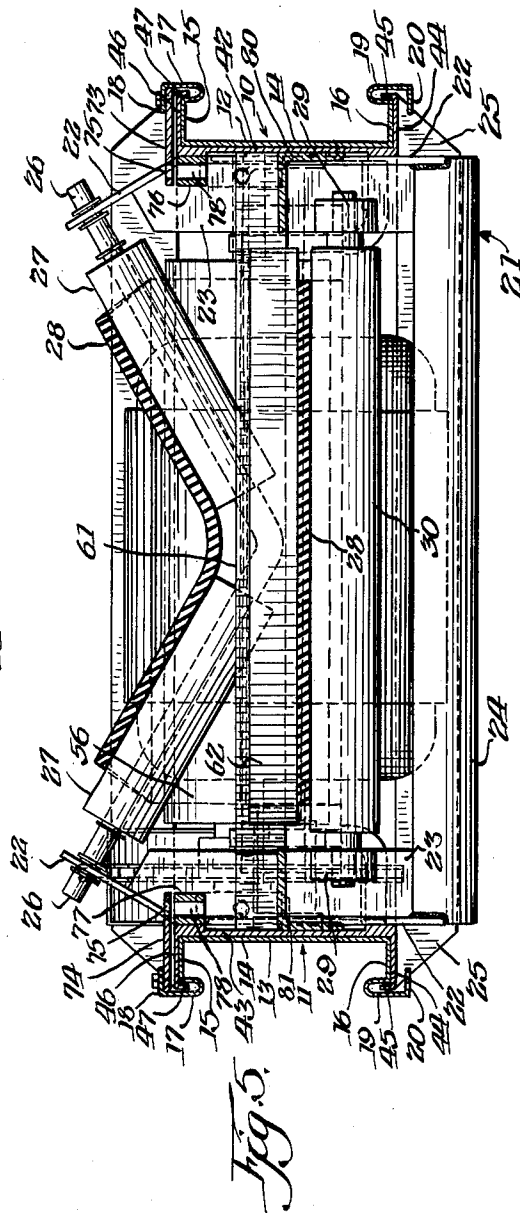
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3 Sheets-Sheet 3



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CONVEYOR CONSTRUCTION

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7 Claims. (Cl. 198-208)

This application is a continuation-in-part of co-pending application Serial No. 111,427 filed May 18, 1961 entitled "Method and Apparatus for Transporting Concrete," now Patent No. 3,151,732.

My invention relates to conveyor construction and has particular reference to a conveyor combination consisting of a primary conveyor section and a tail conveyor section telescopically connected with, and attached to, the tail end of the main conveyor whereby the conveyor belt forming a part of the combination can be maintained under, and adjusted to the, proper tension for use in conveying materials such as concrete mix, sand, gravel, or the like and which can be adjusted to proper tension when the conveyor belt stretches or becomes loose in service in order that proper performance can be obtained in the conveying of material.

A further object of my invention is the provision of a tail section telescopically connected to the main conveying section in such manner that adjustment as to tension and also to proper alinement can be made of the conveyor belt which is endless in form and travels over rollers at each of the ends of the conveyor for the purpose primarily of conveying concrete mix from a point of loading to a point or discharge either for actual laying in a floor structure or onto another conveyor whereby concrete mix is conveyed from one point to another as more fully described in Patent No. 3,151,732.

In the erection of concrete buildings, the matter of transporting concrete for the purpose of erecting the columns for supporting the floors and for the building of the floors themselves has become a major problem in the erection of such buildings and which heretofore has usually been accomplished by the use of elevators carrying concrete mix from the ground to the desired level of the structure in some form of container, depositing the mix in buggies and then moving the buggies to the point of use of the concrete mix. Applicant as a co-inventor has assisted in providing a series of lightweight, movable conveyors which can be moved from place to place and arranged in such manner that concrete is transported upon movable, flexible belts upon a series of conveyors and is discharged from the last conveyor at the point of use of the concrete where it is spread and tamped into position to form the final unit desired whether this be a supporting column for the building or for floor construction within the building with the supporting side walls and the like, if desired. This particular system is being quite successfully used in present day construction which lowers the cost of the erection of such buildings and also adds materially to a saving in time in that the floors can be laid three or four times as rapidly as was possible through the use of buggies. To obtain the best results, it is necessary that the concrete be delivered to its final point of use in as nearly the same condition as it was when it left the mixer as possible in order to secure bonding qualities of the concrete mix and the necessary strength. To accomplish these results, it is necessary that the conveyor belts travel at a high speed up to 500 or 600 feet per minute and be so arranged as to retain the concrete in a solid fixed stream as much as possible during such transportation to its ultimate point of use, which movement makes it necessary and desirable to retain the conveyor belts under sufficient tension to satisfactorily perform their service and avoid slippage on the driving pulleys and the like, it be-

ing customary to provide a tension upon the conveyor belts of somewhere around 2000 pounds during their operation.

A further object of my invention is to provide a conveyor in which such tension can be provided and maintained and also to provide means for keeping the belt in proper alinement with the conveyor structure in order to provide future proper operation.

Another and further object of my invention is the provision of a conveyor consisting of two units, one of which is movable with respect to the other, one of which has a power and belt driving means therein with an endless conveyor belt substantially spanning the length of the two units with adjustable means for connecting the two units, whereby relative longitudinal movement may be had of the units for controlling the tension of the belt without in any manner disturbing the relationship of the power unit and belt driving means.

These and other objects of my invention will more fully be understood by reference to the accompanying drawings and in which:

FIGURE 1 is an elevational view of the tail end section of a conveyor and a portion of the receiving end of the main conveyor, including coupling means for securing the sections together;

FIGURE 2 is a figure illustrating the head or discharge end of the main conveyor and taken in connection with FIGURE 1 illustrates a complete conveying unit with the middle section broken away;

FIGURE 3 is a plan view of the sections illustrated in FIGURE 1 of the drawings;

FIGURE 4 is a sectional view taken on lines 4-4 of FIGURE 3 of the portion of the conveyor unit shown in FIGURE 3; and

FIGURE 5 is a transverse sectional view taken on line 5-5 of FIGURE 4.

Referring specifically to the drawings and in which like reference characters refer to like parts throughout, a main conveying unit indicated as a whole as 10 is shown and to which a tail unit 11 is telescopically secured to form the complete combination. The main section 10 consists of a pair of side rails 12 and 13, which said rails normally are about 30 feet in length, of lightweight material such as aluminum and the like and are made with central web portions 14, upper flange portions, 15, 15 and lower flange portions 16, 16. Each of the upper flange portions 15, 15 has U-shaped flanges 17, 17 thereon, which have inwardly turned ribs 18, 18 on their upper edges, while the lower flanges 16, 16 have inverted U-shaped flanges 19, 19 thereon and which also have inwardly turned ribs 20, 20 thereon, with the members 12 and 13 being placed in right and left position so that the flanges 15, 15 and 16, 16 extend outward from the webs 14, 14 of the side rails 10 and 11.

A series of frame 21, 21 are provided in spaced relation with each other throughout the length of both sections 10 and 11 of the conveyor, which secure the side rails of each section together and provide support for some of the operating parts of the conveyor, one of such units being illustrated in detail in FIGURE 5 of the drawings. Each of the frames 21, 21 consists of cheek plates 22, 22 which cheek plates in the main conveyor section 5 are fitted against the inner faces of each of the side rails 12 and 13 and are welded thereto and have webs 23, 23 thereon which extend inwardly from the cheek plates 22, 22 which at their central portions are T-shaped in cross-section with the cheek plates 22, 22 forming the head of the T, while the webs are in the relative position of the shank of a T. The lower ends of the cheek plates 22, 22 have saddles formed therein and are fitted over and welded to tubular transverse member 24 which connects a pair of cheek plates 22, 22 together, with the cheek plates

22, 22 having triangular shaped members 25, 25 formed thereon which underlie the lower flanges 16, 16 on the side rails 12 and 13 of the main conveyor section 10, but differs slightly with respect to the tail section as will be hereinafter more fully described. The upper ends of each of cheek plates 22, 22 are inwardly turned and have roll-supporting angularly disposed axles 26, 26 mounted therein, which said axles 26, 26 have rollers 27, 27 mounted thereon inclined toward the center of the conveyor and over which the upper flight of the conveyor belt 28 is positioned in the operation of the conveyor. The attached webs 23, 23 of the cheek plates 22, 22 toward their inner edges have bearing blocks 29, 29 welded thereto within which the ends of an axle of a roller 30 are mounted, which roller 30 extends from side to side of the conveyor and supports the lower flight of the belt 28 as it travels throughout the length of the conveyor.

The head or discharge end of the conveyor has a bail designated as a whole as 30a and which comprises a top portion 31 which spans the space above the side rails 12 and 13 and has leg portions 32, 32 depending therefrom, which leg portions are fitted against the inner faces of the side rails 12 and 13 at their ends and which extend therebelow for a short distance and have angles 33 at each of its sides which are welded to the lower ends of the leg portions 32, 32 and extend outward beyond the ends of the side rails 12 and 13 and which rest upon and form support members for the discharge end of the conveyor when the conveyors are connected together in series and supported by stands described in detail in said application Serial No. 111,427, now Patent No. 3,151,732, but which forms no part of this present invention.

A cross angle 34 is welded at each of its ends to the projecting leg portions 32 below the rails 12 and 13 of the bail 30 and which holds the ends of the rails 12 and 13 in fixed relation with each other at the head or discharge end of the conveyor. A funnel-shaped member 35 is provided, open at its top and bottom, but having an angular disposed bottom portion 36 for directing concrete mix toward the open lower discharge end of the funnel 35, which funnel 35 is welded or otherwise secured to the leg portions 32 of the bail 30. A boot 37 is provided which is curved longitudinally and also transversely and is secured to the top portion 21 of the bail 30 by means of a bolt 38 and is curved and fitted inside of the funnel 35 and secured in position by means of a bolt 39 passing therethrough. A cross member 40 is provided which is welded at each of its ends to the inner faces of the legs 32 and spans the space between the rails 11 and 12 and is in engagement as a scraper for the outer surface of the lower flight of the endless belt 28 so as to remove loose particles of concrete and the like which may adhere thereto in the operation of the belt. Bearings such as 40a are provided which are mounted in the leg portions 32 of the legs on each side of the conveyor with a roller 41 being mounted therein over which the endless conveyor belt 24 runs as it travels the length of the conveyor.

The tail unit 11 consists of a pair of side rails 42 and 43, preferably channel sections, each of said side rails having central web portions having outwardly extending flanges 44 thereon, each of said flanges 44, 44 having ribs 45, 45 on their outer edges and having outwardly extending upper flanges 46, 46 thereon each of which flanges 46, 46 has downwardly extending ribs 47, 47 thereon on their outer edges. The inner end portion of the side rails 42 and 43 are in overlapped sliding relation with the end portions of the side rails 11 and 13, with the webs of each of said rails being in face-to-face relation with each other and the outwardly turned flanges of each of the rails also being in face-to-face relation with each other and with the upwardly turned ribs 45—45, on the channel portion 16 extending upward into the inverted U-shaped flanges on the side rails 11 and 12 of the main conveyor and with the ribs 47 on the flanges 46, 46 extending into the U-shaped flanges 15, 15 on the rails 12 and 13 of the main conveyor section, these fittings being fairly close

with the ends of the side rails 12 and 13 of the main conveyor section and the ends of the side rails 42 and 43 of the tail section being overlapped a sufficient distance so that in effect the side rails are continuous so far as strength and stability are concerned and yet are movable relative to each other in a longitudinal direction. The other ends of the side rails 42 and 43 are held in place by cross angles 47, 47 welded thereto, which hold the rear ends of the rails together and provide stability for the rails so that in effect they form an integral part of the conveyor. Intermediate the ends of the rails is one of the frames 21, which is constructed precisely like the frames 21 heretofore described but has its cheek plates 22, 22 in engagement with the inner face of the web portions of the rails 42 and 43 with the cross member 24 holding the frame 21 from spreading at its lower side and in effect providing a solid unit for the tail section of the conveyor. A motor frame 48 is secured by means of bolts 49, 49 to cross angles 47, 47, the motor frame having an electric motor 50 mounted thereon with the usual motor shaft 51 being provided, on the outer end of which is a sprocket wheel 52 over which an endless sprocket chain 53 is mounted which is in engagement with a larger sprocket wheel 54 which is secured on the end of a roller shaft 55 and upon which a drive roller 56 is mounted. Bearing housings 57 are secured to the inner faces of the side rails 42 and 43 with adjusting screws 58, 58 being carried by the bearing housing which engage in movably mounted bearings 59, 59 within which the drive roller shaft 55 is positioned. The purpose of the screws 58, 58 is to adjust the roller bearings 59, 59 in such manner that the drive roller 56 in the shaft 55 is perpendicular to the longitudinal axis of the conveyor and of the belt 28 so the belt will run true and not have a tendency to run to one side or the other of the conveyor and also to keep each side of the belt under equal tension for proper operation.

A gravel shield 60 is secured to the inner face of the side rail 43 to provide protection from gravel, stones or the like being thrown into the sprocket chain 53 causing damage to the gears and the like. An angular positioned scraper bar 61 is provided which has a resilient blade 62 mounted thereon and which engages the inner surface of the lower flight of the belt 28 to remove gravel, concrete, and other material which may be carried by the belt in its return movement toward the tail end of the conveyor and assists in removing foreign material from the belt which otherwise might be carried to the surface of the roller 56 and upon the surfaces of the belt, thereby reducing the friction and provide wearing on the belt and possible damage thereto. The scraper bar 61 is secured at each of its ends by bolts 63, 63 which extend through the side rails 42 and 43 so that the bar 61 is securely held in position.

A second scraper bar 64 is provided which has angularly disposed ends 66, 65, each of which end portions has slots 66 therein through which bolts 67, 67 pass which secure the cross bar 64 in adjustable position relative to the roller 56 and belt 28 with a rubber scraper bar 68 being mounted on the bar 66 and into contact with the inner face of the lower flight of the belt 28 adjacent the drive roller 56 so that any foreign material which may have escaped removal by the cross bar 62 is removed by this second scraper before reaching the drive roller 56. The ends 65 of the bar are somewhat angularly disposed to the surface of the belt so that the scraper 68 is tilted at a slight angle as it engages with the inner face of the belt surface before it reaches the roller 56.

A pair of vertically positioned guide rollers 68 and 69 and for engagement with the side edges of the lower flight of the conveyor belt 28 which are mounted upon vertical axles 70 and 71 having curved lower ends fitted into brackets 72, 72 which are welded or otherwise secured to the sides of the side rails 42 and 43. The guide

rollers 68 and 69 assist in securing proper alinement of the lower flight of the conveyor belt 28 onto the drive roller 56.

A pair of connector plates 73 and 74 are provided which extend longitudinally of the side rails 12 and 13 adjacent the tail unit 10 and are bolted along their outer edges to the inwardly turned ribs 18, 18 on the U-shaped flanges 17, 17 forming a part of the side rails 12 and 13, which plates have a plurality of spaced holes 75, 75 therein along their inner edges for purposes hereinafter described. Connector bars or plates 76 and 77 are provided having spaced holes 78, 78 therein which bars or plates 76 and 77 are welded to the side rails 42 and 43 along the inner faces of the said rails along the upper marginal edges of the web portions thereof and in such position that one of the holes 78, 78 may be brought into register with one of the spaced holes 75, 75 in the plates 73 and 74 by longitudinal movement of the sections 10 and 11 with each other and pins such as 79 inserted through such alined holes so that the tail section of the conveyor is held in proper position relative to the main section.

Angles 80 and 81 are welded to the inner faces of the side rails 42 and 43 respectively at the ends of the said plates adjacent the section 10 with one flange of the angle being fitted against the web portion of the side rails 42 and 43 and welded thereto while the other flanges 82, 82 extend inwardly toward the opposite side of the conveyor and has slotted openings 83, 83 therein within which cross bars are placed for the tensioning of the conveyor belt 24 when it is positioned on both the main conveyor section and the tail unit as herein described by means of jacks placed against the bar with the opposite ends thereof in engagement with the webs 23 on the cheek plates 22 which form a part of the frame 21 adjacent the end of the main conveyor toward the unit tail section of the conveyor and through the use of the jacks with the pins 79, 79 being removed from the holes in the registering plates and the two sections forced apart thereby putting the desired tension upon the belt 28 to secure the desired result in conveying the material, which as explained hereinabove is somewhere around 2000 pounds.

The assembling and operation of the apparatus is very simple and can readily be understood from the preceding description, but simply stated, when the apparatus is assembled, the tail section 11 is placed into position with the main section 10 by fitting the said tail section 11 into engagement with the main section by placing the side rails 42 and 43 inside of the side rails 12 and 13 of the main section and with the pins 79 being removed from the holes 78, the sections are simply pushed together loosely and jacks of almost any form or description, such as the usual lifting jack or automobile jack, is placed in longitudinal relationship with the ends of the rails 12 and 13 with one end of the jacks being anchored against the web 23 on the jack plates 22 located on the main section and the other end of the jacks placed in the openings 83, 83 in the flanges 82, 82 on the angles which are secured to the ends of the side rails 42 and 43, a power applied to the jacks until the conveyor belt has been drawn to the desired tightness and which as explained hereinabove for proper service, such tension should be in the neighborhood of 2,000 pounds.

Also, it is highly important to keep the belt properly alined in its operations which means that it must run in direct fashion over the drive roller 56 which roller can be adjusted by means of the movable bearing blocks 59, 59 to proper alinement relative to the longitudinal axis of the conveyor.

While I have described more or less precisely the method employed and the apparatus used therewith, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form and the proportion of parts and the substitution of equivalents as circum-

stances may suggest or render expedient without departing from the spirit or scope of my invention.

I claim:

1. A combined conveyor and power unit assembly for transporting concrete mix comprising, a main section, side rails on each side of the said main section having laterally extending flanges at the edges thereof, a tail section, side rails on each side of said tail section having laterally extending flanges at the edges thereof, cross frames intermediate the ends and secured to the side rails of each of said sections, cross angles secured to one of the ends of the side rails of each of said sections, the flanges of the rails of one of said sections being spaced apart a greater distance than the flanges on the other of said sections whereby the side rails of one section are telescopically fitted within the flanges of the other section, a power driven drive roller in said tail section, a drive motor for driving said drive roller mounted on said tail section, a roller at the discharge end of said main section, an endless load supporting belt extending over the said roller on said main section and said drive roller on said main section, and means including plates in overlapping engagement with each other secured to the said side rails having spaced openings therein adapted to receive pins for holding said main and tail sections in adjusted positions relative to each other to maintain required tension on said conveyor belt without altering the relative positional relationship of said drive roller and said drive motor.

2. The apparatus recited in claim 1, further characterized by a scraper means adjacent the return flight of said endless conveyor in advance of said roller, said scraper mounted on said tail section to maintain the relative positional relationship between said scraper means with said drive motor and said drive roller during adjustments of said tail section relative to said main section.

3. The apparatus recited in claim 2 further characterized by a second angularly positioned scraper mounted on said tail section to maintain the relative positional relationship between each of said scraper means, said drive motor, and said drive roller during adjustments of said tail section relative to said main section.

4. The apparatus recited in claim 1 further characterized by a pair of side guide idlers mounted on said tail section to maintain the relative positional relationship between said guide idlers, said scraper means, said drive motor and said drive roller during adjustments of said tail section relative to said main section.

5. The apparatus recited in claim 1 further characterized by a return idler mounted on said tail section to maintain the relative positional relationship between said return idler, said scraper means, said drive motor, and said drive roller during adjustments of said tail section relative to said main section.

6. The apparatus recited in claim 1 further characterized by a V-idler mounted on said tail section to maintain the relative positional relationship between said V-idler, said scraper means, said drive motor, and said drive roller during adjustments of said tail section relative to said main section.

7. The apparatus recited in claim 1 further characterized by a jack engaging means on each of said tail and main section to move one of said sections telescopically relative to the other of said sections.

References Cited by the Examiner

UNITED STATES PATENTS

1,801,906	4/31	Humy et al.	198—204
1,825,572	9/31	Boger	198—204
1,875,535	9/32	Whitney	104—91
2,298,472	10/42	Dudley et al.	198—204

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