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CONVEYOR SUPRORTING SYSTEM

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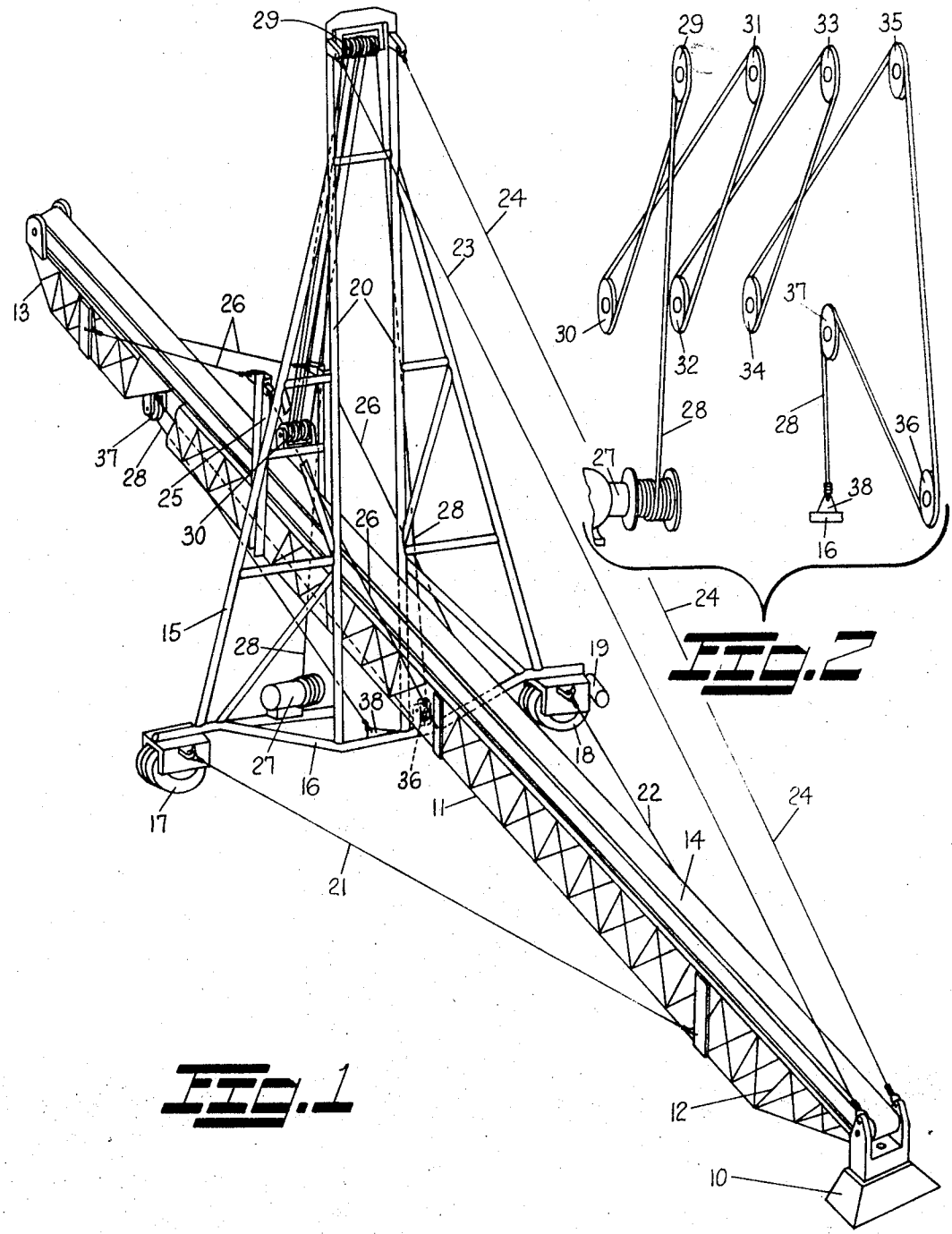


FIG. 1

FIG. 2

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CONVEYOR SUPPORTING SYSTEM

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ABSTRACT OF THE DISCLOSURE

A vertically positionable radial stacker having a reeving arrangement whereby the hoisting cable serves in maintaining a constant radial relationship between the anchor pivot point and the supporting structure, without the necessity of having rigid strut members.

BACKGROUND OF THE INVENTION

This invention relates generally to conveying apparatus of the type known as radial stackers, with which apparatus loose materials of all kinds can be piled to much greater heights than would be possible with dump trucks. It relates more particularly to the manner in which the hoisting cable for the stacking conveyor is reeved to overcome the tensions that would normally urge the supporting structure out of position at its base.

Radial stackers of the type described have tended toward ever increasing lengths, which places tremendous weights and compressive forces upon the supporting structure that raises and lowers the conveyor boom. As these booms are generally pivotally fixed at a tail end and movably supported at a point intermediate both ends, the outwardly extending section demands that the supporting structure be reinforced with struts and other bracing which make the entire apparatus excessively cumbersome. Apparatus of the prior art which has been pivoted upon supporting wheels, has required considerable bracing to preserve true radial tracking of the wheels and to prevent inward movement of the base of the supporting structure. This problem is overcome simply by this invention with reductions in overall weight and manufacturing costs.

SUMMARY OF THE INVENTION

This invention provides a supporting system for keeping the mast and wheeled carriage of a radial stacker in a vertical position and at a fixed radius with the anchor pivot. Restricting guy wires limit the supporting mast and carriage from movement which would increase the fixed radius. The novel reeving of the hoisting cable provides tension forces in a direction outwardly from the pivot which act in opposition to the restricting guy wires and thus will maintain the wheeled carriage at a true fixed radius.

It is a general object of this invention to reduce the size and weight of previously required reinforcing struts for radial stacker devices.

It is a further object of the invention to eliminate the need for rigid struts and hinging mechanism for such struts on stackers of this type.

It is a further object to provide a system using wire cables to reinforce a stacker mast which will permit vertical and horizontal position changes during operation.

It is a still further object of the invention to devise a single lightweight means for keeping a stacker mast vertical and at a fixed radial distance from the anchor point.

BRIEF DESCRIPTION OF THE DRAWING

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawing, wherein:

FIG. 1 shows a radial stacker in perspective with the inventive arrangement applied thereto; and

FIG. 2 is a diagrammatic view of the hoisting cable showing the reeving arrangement to provide opposing forces to the anchor cables shown in FIG. 1.

Now referring to the drawing, a radial stacker is shown in an operating position with movement permitted in an arc about a fixed pivot point **10**. It will be understood that the mechanism is also movable as a unit to other locations where fixed pivot points are available. A conveyor boom **11** having one end **12** anchored upon the point **10** and a second end **13** directed outwardly is freely movable within the limits of the mechanism to be further explained. The boom is of fabricated high-strength construction as is well understood in the industry and may extend two hundred or more feet in length. An endless conveyor belt **14** runs the length of the boom and may be rotatively driven by any desired means (not shown).

An upstanding A-shaped frame **15** is in a generally intermediate position along the boom **11** with the ends **13** and **14** extending through on opposite sides. An undercarriage **16** rests upon wheels **17** and **18** with a motor **19** for providing movement to the apparatus in a horizontal plane around the pivot point **10**. The undercarriage **16** extends upwardly to form a supporting mast **20** through which the boom **11** extends and by which it is moved and supported. Anchor cables **21** and **22** of equal length are fastened to the frame **15** near the wheels **17** and **18**, respectively, and are fixed to the boom end **12** to allow rotation at a predetermined maximum radius from the pivot point **10**. Two guy wires **23** and **24** of equal length are secured between the boom end **12** and the top of the mast **20** which they maintain in a vertical plane when the wheels **17** and **18** are in their maximum radial location. A suspending frame **25** is bolted to the conveyor boom **11** at a position outwardly of the frame **15** and is held in an upright position by four guide wires **26** extending to the boom **11**.

Power for moving the conveyor boom **11** vertically within the frame **15** is from a motor-driven winch **27** having a hoisting cable **28** attached for take up. The hoisting cable **28** extends upwardly to a fixed cluster of sheaves at the top of the mast **20** then downwardly to a movable cluster of sheaves held by the frame **25** and alternately back and forth using all sheaves. This reeving is more clearly shown in FIG. 2 where cable **28** passes around sheaves **29, 30, 31, 32, 33, 34** and **35** with the odd-numbered ones being the fixed cluster and the even-numbered being movable by raising and lowering the boom **11**.

The weight of the outwardly extending boom places high tension on the top of the mast **20** in an outward direction against the restraint of the guy wires **23** and **24**. Without some means to prevent it, these forces would tend to urge the undercarriage **16** toward the pivot point **10**, thus reducing the radial tracking distance and putting the frame **15** out of plumb, which would be a dangerous condition. This invention provides a simple means for tensioning the undercarriage **16** outwardly from the pivot point **10** and keeps the anchor cables **21** and **22** taut at all times. The hoisting cable **28** is extended downwardly from the sheave **35** to a single fixed sheave **36** secured to the undercarriage **16**. The cable **28** is then drawn outwardly and reeved about a single sheave **37** secured to the outward end **13** and then doubled back to a dead-end fixture **38** on the undercarriage **16**. The forces exerted upon the hoisting cable **28** by the winch **27** in raising or lowering the conveyor boom **11** have a positive relationship with the forces exerted outwardly upon the undercarriage **16** by the double lap of cable **28** extending to the sheave **37**.

This system maintains a continual tension on the anchor cables **21** and **22** with the opposing pull of the hoist-

ing cable's reeving arrangement thereby preserving the true radial tracking path of the wheels without use of long heavy struts.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof.

We claim:

1. A radial stacker apparatus comprising

(A) a horizontally movable frame including:

(1) a wheeled carriage, and

(2) a supporting mast upwardly extending from said carriage,

(B) a conveyor boom supported centrally from said mast having:

(1) an anchored pivot end, and

(2) an outwardly directed free end,

(C) an endless conveyor belt extending generally between said two ends,

(D) anchor cables connected between said wheeled carriage and said pivot end to allow a fixed maximum radius therebetween,

(E) anchor guy wires connecting said supporting mast and said pivot end,

(F) hoisting means carried by said movable frame and said conveyor boom for raising, lowering and supporting said free end, and

(G) tensioning means deriving tension forces from said hoisting means for biasing said wheeled carriage outwardly toward said free end.

2. Apparatus as defined in claim 1, wherein said hoisting means includes

(A) a winch mechanism,

(B) a hoisting cable having a first end connected to said winch mechanism for take-up and let-off,

(C) a fixed sheave cluster fastened on top of said supporting mast,

(D) a movable sheave cluster fastened centrally of said conveyor boom,

(E) said hoisting cable being reeved alternately between said fixed sheave cluster and said movable sheave cluster, and

(F) said hoisting cable having a second end which interconnects said wheeled carriage and said free end of said boom for maintaining a continual tension outwardly upon said wheeled carriage.

3. Apparatus as defined in claim 2 wherein said tensioning means further includes

(A) a first single sheave secured to said wheeled carriage,

(B) a second single sheave secured to said free end,

(C) said second end of said hoisting cable being reeved from said first single sheave, to said second single sheave, then to said wheeled carriage for dead-end fastening thereon.

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