



(43) International Publication Date
22 May 2014 (22.05.2014)

- (51) International Patent Classification:
B65G 41/00 (2006.01)
- (21) International Application Number:
PCT/EP2013/074202
- (22) International Filing Date:
19 November 2013 (19.11.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
1220775.9 19 November 2012 (19.11.2012) GB
- (71) Applicant (for all designated States except US): **EDGE INNOVATE (NI) LTD** [GB/GB]; 30 Farlough Road, Dungannon Tyrone BT71 4DT (GB).
- (72) Inventor; and
- (71) Applicant (for US only): **CULLEN, Darragh** [IE/GB]; C/O Edge Innovate (NI) Ltd, 30 Farlough Road, Dungannon Tyrone BT71 4DT (GB).
- (72) Inventor: **CULLEN, Darragh**; C/O Edge Innovate (NI) Ltd, 30 Farlough Road, Dungannon Tyrone BT71 4DT (GB).
- (74) Agent: **HANNA, John**; Hanna IP, 58 Howard Street, Belfast Antrim BT1 6PJ (GB).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report (Rule 48.2(g))

(54) Title: A MOBILE CONVEYOR

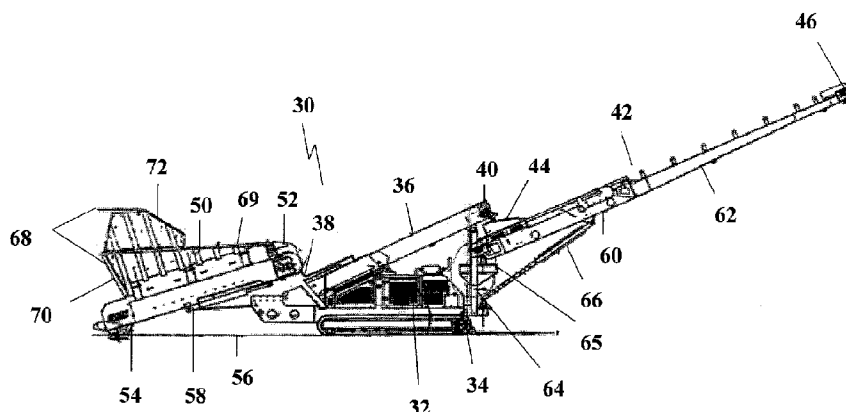


Figure 2

(57) Abstract: The present invention relates to mobile conveyors for conveying or elevating or stacking material into a pile or stock-pile or to a next transport or conveying stage. The mobile conveyors comprise a base having a wheeled or tracked chassis which supports a first conveyor having at least one loading end and at least one discharge end. In one embodiment, the mobile conveyor further comprises a loading feeder having a discharge end above the loading end of the first conveyor, and which is moveable between a raised position wherein the loading feeder is wholly or substantially above a portion of the first conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface. In another embodiment, the first conveyor is rotatable at or near a loading end.



Description**A MOBILE CONVEYOR**

- [0001] The present invention relates to a mobile conveyor for conveying or elevating or stacking material, generally bulk material such as granular or particulate material, e.g. crushed stone, sand, gravel, etc., into a pile or stockpile or to a next transport or conveying stage.
- [0002] Many types and forms of mobile conveyors or stackers are known in the art. Many examples are used in quarries and other worksites for stock piling granular and particulate material, or for conveying such material into further transporters such as shipping conveyors, vehicles and other conveyors. Such conveyors can be mounted on a wheeled or tracked chassis, with a single conveyor being pivotally mounted on the chassis at one end to allow the inclination of the conveyor to be adjusted. The conveyor can be moveable between a transport position and an inclined working position. The conveyor may be telescoping to provide a variable length, and have an additional frame or wheels to allow rotation of the mobile conveyor to achieve radial distribution of the conveyed material such as into an arcuate or kidney-shaped pile.
- [0003] One problem is that the single conveyor can only supply material in one radial direction, such that movement of the complete mobile conveyor is required to achieve radial distribution of the conveyed material such as into an arcuate or kidney-shaped pile.
- [0004] Meanwhile, to assist loading, it is also known to add an apron or hopper at the loading end of the conveyor. However, even if the loading end of the conveyor can reach the ground surface, the use of a hopper means that a loading digger or other similar vehicle is still required to lift the material from the feed lorry to a higher height to reach over the top of the edge of the hopper. Whilst the use of loading diggers may be satisfactory, it would also be useful to be able to directly feed material from a feed lorry onto the conveyor.
- [0005] Thus, according to one aspect of the present invention, there is provided a mobile conveyor comprising a base having a wheeled or tracked chassis, and supporting:

- [0006] - a first conveyor having at least one loading end and at least one discharge end; and
- [0007] - a loading feeder having a discharge end above the loading end of the first conveyor, and moveable between a raised position wherein the loading feeder is wholly or substantially above a portion of the first conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface.
- [0008] In this way, having the loading feeder at a lowered position allows lower access into the loading feeder, preferably direct access from a feeder lorry.
- [0009] Optionally, the first conveyor comprises:
- [0010] - an intermediate conveyor having a loading end and a discharge end; and
- [0011] - an extending arm conveyor having a loading end below the discharge end of the intermediate conveyor, and a distal discharge end, and wherein the loading feeder has a discharge end above the loading end of the intermediate conveyor, and is moveable between a raised position wholly or substantially above the intermediate conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface.
- [0012] According to another aspect of the present invention, there is provided a mobile conveyor comprising a base having a wheeled or tracked chassis, and supporting:
- [0013] - a first conveyor having at least one loading end and at least one discharge end, wherein the first conveyor is rotatable at or near a loading end, and
- [0014] - a loading feeder having a discharge end above a loading end of the first conveyor.
- [0015] In this way, a radial distribution of material is possible from the discharge end without need to move the remainder of the mobile conveyor.
- [0016] Optionally, the loading feeder is moveable between a raised position wherein the loading feeder is wholly or substantially above a portion of the first conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface.
- [0017] More optionally, the first conveyor comprises:

- [0018] - an intermediate conveyor having a loading end and a discharge end; and
- [0019] - an extending arm conveyor having a loading end below the discharge end of the intermediate conveyor, and a distal discharge end, and wherein the extending arm conveyor is rotatable at or near its loading end.
- [0020] According to one embodiment of the present invention, there is provided a mobile conveyor comprising a base having a wheeled or tracked chassis, said conveyor supporting:
- [0021] (i) a intermediate conveyor having a loading end and a discharge end;
- [0022] (ii) an extending arm conveyor having a loading end below the discharge end of the intermediate conveyor, and a distal discharge end; and
- [0023] (iii) a loading feeder having a discharge end above the loading end of the intermediate conveyor, and moveable between a raised position wholly or substantially above the intermediate conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface.
- [0024] The terms “raised” and “lowered” are used herein as being relative to each other, and also relative to the ground surface.
- [0025] The term “ground surface” as used herein relates to the surface on which the mobile conveyor is based, and on which feeder lorries generally travel to and from the mobile conveyor.
- [0026] The mobile conveyor may be moveable by the use of one or more tractors or tractor units or other heavy vehicles known in the art. Preferably, the mobile conveyor is self-propelled. It may be self-propelled by the use of one or more power units, motors, etc. being part of the mobile conveyor, and in a manner known in the art.
- [0027] Optionally, the mobile conveyor comprises a base with a tracked chassis, to allow easier movement of the mobile conveyor around a work site, in particular, a rough or uneven work site. Optionally, the mobile conveyor comprises one or more sets of wheels or tracks, optionally on more than one chassis or axles or both.
- [0028] The first conveyor may be a single conveyor, or have a single conveying means, generally an endless belt or other moveable surface able to convey material between its loading end and its discharge end. Alternatively, the first conveyor may comprise more than one conveyor,

including but not limited to at least an intermediate conveyor and an extending arm conveyor.

- [0029] The intermediate conveyor generally comprises a moveable conveying surface able to convey material between its loading end and its discharge end. Preferably, the intermediate conveyor is pivotally mounted at or near its loading end to the base. Optionally, the intermediate conveyor is inclined, and more optionally has an adjustable inclined position based on its pivotal mounting.
- [0030] The intermediate conveyor is preferably moveable between a transport position and an inclined working position. Optionally, the transport position has a more horizontal aspect than the working position.
- [0031] The extending arm conveyor has a loading end below the discharge end of the intermediate conveyor, such that material from the intermediate conveyor is discharged onto the extending arm conveyor, and carried to its discharge end being distal from its loading end.
- [0032] Optionally, the extending arm conveyor is extendable, either telescopically, or by unfolding, or by a combination of same. Extendable conveyors are known in the art, and are generally adapted to extend the distance, also often the height, of a distal discharge end, so as to be able to provide a higher or greater pile or stockpile of material from the mobile conveyor.
- [0033] Optionally, the mobile conveyor and/or the first conveyor and any extending arm conveyor includes one or more support arms, such support arms optionally being extendable, to help move and/or support the first conveyor or extending arm conveyor, especially with an extended length.
- [0034] Optionally, the first conveyor and/or the extending arm conveyor is rotatable about a loading end, such that the discharge end of the conveyor is able to discharge material in more than one location without movement of the remainder of the mobile conveyor. In particular, the ability of the extending arm conveyor to be displaceable in a radial manner allows it to form an arcuate or kidney-shaped pile or stockpile of material from its discharge end, from a single position of the mobile conveyor.
- [0035] Optionally, the first conveyor and/or extending arm conveyor is moveable between a transport position and an inclined working position. The

transport position may have a more horizontal aspect than the inclined working position, and may include retracting or folding one or more parts of the first conveyor or extending arm conveyor from its working position.

- [0036] The loading feeder may comprise a loading apron and a conveyor. The loading apron may comprise one or more walls, generally rising from at or near the base of the loading feeder and able to direct material provided into the loading feeder towards one end of the conveyor. The conveyor is then able to provide material towards a discharge end, which discharge end is able to load the first conveyor and/or intermediate conveyor at its loading end.
- [0037] Optionally, the loading apron of the loading feeder of the present invention comprises one or more moveable apron portions. More preferably, at least one of the moveable apron portions lowers the height or a portion of the loading apron relative to the ground surface. More preferably, the loading apron is accessible to a feed lorry when the loading feeder is in its lower position.
- [0038] The loading feeder is preferably moveable between a raised position wholly or substantially above a portion of the first conveyor, such as the intermediate conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface. In its raised position, the loading feeder may be located directly above the intermediate conveyor.
- [0039] In its lowered position, a part of the loading feeder is at or near a ground surface. Such a part of the loading feeder may be one or more ground engaging studs, buffers or feet, etc., extending from the other end of the loading feeder from its discharge end.
- [0040] The mobile conveyor may include one or more arrangements or mechanisms able to move the loading feeder between its raised position and its lowered position, including one or more hydraulic rams.
- [0041] In its lowered position, the loading feeder may be more easily accessible to the conveyor, loader, feeder, etc. that is supplying material into the loading feeder.
- [0042] Preferably, the loading feeder is directly accessible to a feed lorry when the loading feeder is in its lowered position. That is, a feed lorry, generally

being a tipper truck or the like having material in an inclinable loader, can directly load its material into the loading feeder, thereby avoiding the need for an intermediate loading digger or the like to convey material from the back of the feed lorry and into the loading feeder. Such an arrangement may still be desired, but the operator is now able to feed material directly from feed lorries, which can be and generally are public road vehicles.

- [0043] The skilled man will be aware that the present invention can be a combination of different embodiments or features described herein, such that the present invention covers all such combinations whether explicitly described or obviously combinable.
- [0044] The materials able to be conveyed by the present invention are as described herein, generally being bulk material such as granular or particulate material, some being termed 'aggregates', and including but not limited to crushed stone, sand, gravel etc. Such materials are commonly stockpiled for subsequent use, and ease of stockpiling is the major aim of many operators, using the minimum of conveying equipment needed to achieve the desired stockpile.
- [0045] Embodiments of the present invention will now be described by way of example only, and with reference to the accompanying drawings in which:
- [0046] Figure 1 is a side view of a first mobile conveyor according to one embodiment of the present invention; and
- [0047] Figure 2 is a side view of a second mobile conveyor according to a second embodiment of the present invention.
- [0048] Referring to the drawings, Figure 1 shows a first mobile conveyor 2 comprising a base 4 having a tracked chassis 6 and supporting a first conveyor 8, having at least one loading end 10 and at least one discharge end 12. Figure 1 also shows the mobile conveyor 2 supporting a loading feeder 14, having a discharge end 16 above the loading end 10 of the first conveyor 8.
- [0049] The loading feeder 14 is movable between a raised position wherein the loading feeder is wholly or substantially above a portion of the first conveyor 8, and a lowered position wherein a part of the loading feeder 14 is at or near a ground surface 18. Figure 1 shows the loading feeder 14

being in its raised position.

- [0050] Figure 1 also shows the first conveyor 8 being a single conveyor, pivotally mounted to the base 4 at or near its loading end 10, and extending to its discharge end 12 to provide a stockpile 20 of material.
- [0051] Figure 1 also shows a loading digger 22 required to achieve sufficient height for loading material over the edge of the walls of the loading feeder 14 in a conventional manner.
- [0052] Figure 1 also shows two hydraulic rams 24 on one side of the mobile conveyor 2 between the base 4 and/or the first conveyor 8, and the loading feeder 14, (with an equivalent set of hydraulic rams are located on the other side of the mobile conveyor 2 in an equivalent manner). The hydraulic rams 24 enable movement of the loading conveyor 14 from its raised position as shown in Figure 1, to a lowered position (not shown) wherein a part of the loading feeder 14 is at or near the ground surface 18. This arrangement is described in more detail in relation to Figure 2.
- [0053] Figure 2 shows a second mobile conveyor 30 according to the present invention, comprising a base 32 having a tracked chassis 34, and supporting a first conveyor comprising an intermediate conveyor 36 having a loading end 38 and a discharge end 40, and an extending arm conveyor 42 having a loading end 44 below the discharge end 40 of the intermediate conveyor 36, and a distal discharge end 46.
- [0054] The second mobile conveyor 30 also comprises a loading feeder 50 having a discharge end 52 above the loading end 38 of the intermediate conveyor 30, and movable between a raised position wholly or substantially above the intermediate conveyor 30, and a lowered position wherein a part of the loading feeder 50 is at or near a ground surface.
- [0055] Figure 2 shows the loading feeder 50 in a lowered position, wherein a ground engaging foot 54 is engaging the ground surface 56.
- [0056] The second mobile conveyor 50 has hydraulic rams 58 on each side between it and a part of the base 32, able to move the loading feeder 50 from its lowered position as shown in Figure 2, to a raised position wherein the loading feeder 50 is wholly or substantially above the intermediate conveyor 36.

- [0057] Preferably, each of the first and second mobile conveyors 2, 30 are self-propelled by the use of one or more power units, generally engines, within the bases 4, 32.
- [0058] Figures 1 and 2 show the first conveyor 8, intermediate conveyor 36 and extending arm conveyor 42 being inclined.
- [0059] Figure 2 shows the extending arm conveyor 42 having a lower portion 60, and an upper portion 62. Preferably, the upper portion 62 is foldable via one or more hinges or pivots to a foldable position (not shown), to reduce the extent or overhang of the extending arm conveyor 42 either when the mobile conveyor is not in use, or is being transported to a new working position or site.
- [0060] Figure 2 shows a support stanchion 64 between the base 32 and a location near the discharge 40 of the intermediate conveyor 36. The stanchion 64 may be used to support the discharge end 40 of the intermediate conveyor 36. The stanchion 64 also supports the extending arm conveyor 44 at its proximal end, being the same as or near to its loading end 44, via a support assembly 65. The support assembly 65 also allows radial rotation of the extending arm conveyor 42 about the stanchion 64, such that in use, material being discharged from the discharge end 46 of the extending arm conveyor 42 can be located in a number of radial positions relative to the position of the second mobile conveyor 30.
- [0061] In Figure 2, the extending arm conveyor 42 is also supported via a hydraulic ram 66 extending from the base 32 to a position between the loading end 44 and the discharge end 46 of the extending arm conveyor 42. Optionally, the hydraulic ram 66 provides general support to the extending arm conveyor 42, as well as support and assistance in radial movement of the extending arm conveyor 42 as described above.
- [0062] The loading feeder 50 in Figure 2 comprises a loading apron 68 and a conveyor (not shown). The conveyor is generally located at or along the base of the loading feeder 50, is able to convey material fed into the loading feeder 50 to its discharge end 52.
- [0063] The loading apron 68 comprises a number of walls or portions, generally

including at least two upstanding side walls 69 and a back wall 70, providing a generally horizontal upper rim so as to provide a loading area in the manner of a bin or a hopper, and able to accept material across a wider area than the base of the conveyor therebelow. Hoppers or hopper bins etc. are well known in the art, and may include additional higher walls 72 to provide additional restrictions to the direction of movement of material being feed into the loading feeder 50 in a manner known in the art.

- [0064] The loading feeder 50 may include other stability units, devices or mechanisms, including jacks, landing gear, buffers, etc., able to provide stability for the loading feeder 50, especially in its lowered position.
- [0065] In one embodiment of the present invention, at least one of the moveable apron portions of the loading feeder 50 moves in such a manner or direction so as to lower the height of a portion of the loading apron relative to the ground surface 56. For example, the rear wall 70 could be lowered relative to the side walls 69, to a point where its upper edge or rim is below the discharge end of a feed loader, such as a tipper truck or tipper lorry, such that material from such a feed loader can be provided directly into the loading feeder 50 without need for an intermediate digger such as the digger 22 shown in Figure 1.
- [0066] The present invention shows a number of embodiments having surprising improvements over known conveyors, and the skilled person is able to recognize combinations of such embodiments and advantages from the present description.

Claims

1. A mobile conveyor comprising a base having a wheeled or tracked chassis, and supporting: a first conveyor having at least one loading end and at least one discharge end; and a loading feeder having a discharge end above the loading end of the first conveyor, and moveable between a raised position wherein the loading feeder is wholly or substantially above a portion of the first conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface.
2. A mobile conveyor as claimed in claim 1 wherein the first conveyor comprises: an intermediate conveyor having a loading end and a discharge end; and an extending arm conveyor having a loading end below the discharge end of the intermediate conveyor, and a distal discharge end, and wherein the loading feeder has a discharge end above the loading end of the intermediate conveyor, and is moveable between a raised position wholly or substantially above the intermediate conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface.
3. A mobile conveyor comprising a base having a wheeled or tracked chassis, and supporting: a first conveyor having at least one loading end and at least one discharge end, wherein the first conveyor is rotatable at or near a loading end, and a loading feeder having a discharge end above a loading end of the first conveyor.
4. A mobile conveyor as claimed in claim 3 wherein the loading feeder is moveable between a raised position wherein the loading feeder is wholly or substantially above a portion of the first conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface.
5. A mobile conveyor as claimed in claim 3 or claim 4 wherein the first conveyor comprises: an intermediate conveyor having a loading end and a discharge end; and an extending arm conveyor having a loading end below the discharge end of the intermediate conveyor, and a distal discharge end, and wherein the extending arm conveyor is rotatable at or near its loading end.
6. A mobile conveyor as claimed in any one of the preceding claims, comprising a base having a wheeled or tracked chassis, and supporting: (i) an intermediate conveyor having a loading end and a discharge end; (ii) an extending arm

conveyor having a loading end below the discharge end of the intermediate conveyor, and a distal discharge end, and being rotatable at or near its loading end; and (iii) a loading feeder having a discharge end above the loading end of the intermediate conveyor, and moveable between a raised position wholly or substantially above the intermediate conveyor, and a lowered position wherein a part of the loading feeder is at or near a ground surface.

7. A mobile conveyor as claimed in any one of the preceding claims wherein the mobile conveyor is self-propelled.
8. A mobile conveyor as claimed in any one of the preceding claims wherein the first conveyor, intermediate conveyor, and/or extending arm conveyor is/are inclined.
9. A mobile conveyor as claimed in any one of the preceding claims wherein the first conveyor, intermediate conveyor, and/or extending arm conveyor is/are moveable between a transport position and an inclined working position.
10. A mobile conveyor as claimed in any one of the preceding claims wherein the first conveyor and/or extending arm conveyor is/are extendible.
11. A mobile conveyor as claimed in any one of the preceding claims wherein the loading feeder has a loading apron and a conveyor.
12. A mobile conveyor as claimed claim 11 wherein the loading apron comprising one or more moveable apron portions.
13. A mobile conveyor as claimed in claim 12 wherein at least one of the moveable apron portions lowers the height of a portion of the loading apron relative to the ground surface.
14. A mobile conveyor as claimed in claim 12 or claim 13 wherein the loading apron to accessible to a feed lorry when the loading feeder is in its lowered position.
15. A mobile conveyor substantially as described herein and with reference to Figures 1-2 of the accompanying drawings.

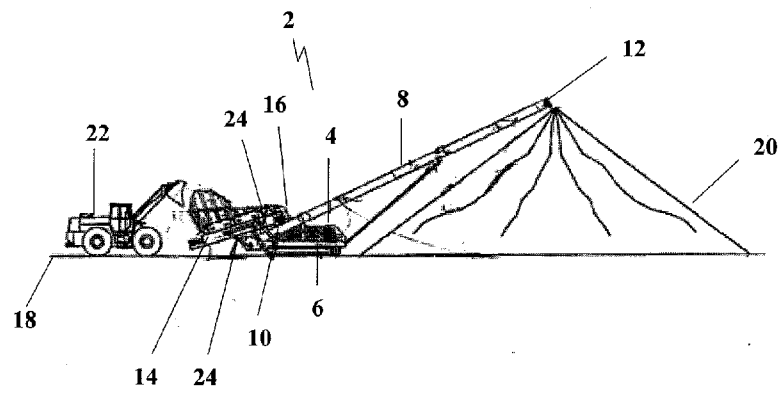


Figure 1

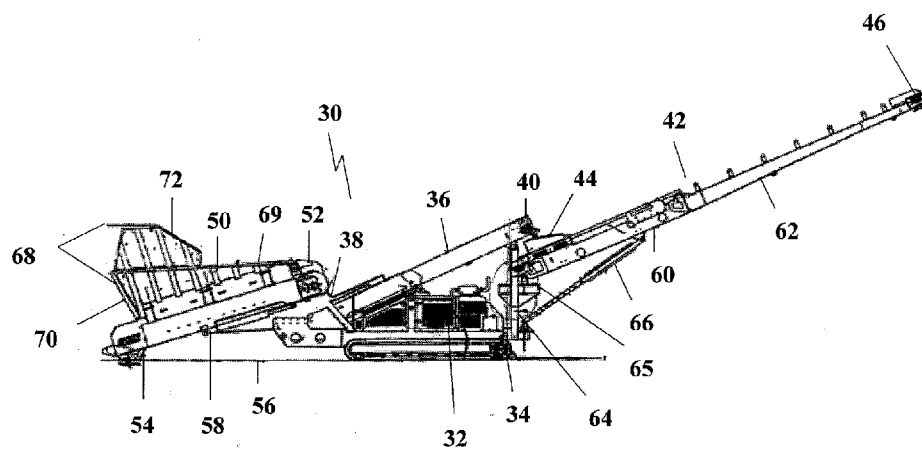


Figure 2