

PATENT SPECIFICATION

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(54) COMPACTING MATERIAL IN SKIPS

(71) We, G.S. COMPACTORS LIMITED, a British Company of 87 High Road, Ickenham, Middlesex do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an arrangement for compacting material in skips.

A compactor is disclosed and claimed in our Patent Application Serial No. 1,427,003. This invention is directed to a compactor arrangement suitable for installation and use at civic amenity sites. Such sites are often owned and operated by a local authority so that members of the public can bring to them their bulky refuse (such as may not be acceptable to the normal refuse collection services). The refuse is then placed in skips and the skips are then transported to a landfill site. This stage of the operation is becoming expensive, particularly because the contents of a skip containing uncompact refuse are largely air.

In this Specification, the word "skip" is defined as meaning a heavy metal container with a capacity of a few hundred cubic feet so that for transportation of the skips, either loaded or empty, special transporters with hoisting gear are required.

In accordance with the present invention, we provide a compactor arrangement for compacting the contents of a skip as herein defined, including a compactor carried by a support structure and having a pressure platen, the pressure platen being mounted for movement generally downwardly and upwardly into and out of a skip, the arrangement also having: means, comprising a ground-based skip support separate from the support structure, for receiving and locating a plurality of skips, means for effecting relative arcuate or linear movement between the compactor and the receiving and locating means, and means between the support structure and the skip support for preventing the support structure

being lifted as a result of the forces applied during compaction, whereby in use the pressure platen of the compactor can be caused to make successive compacting strokes on different skips in turn.

In one version of this invention, the compactor is constructed so that in use the pressure platen performs an arcuate movement relative to a skip, the portion of said movement within the skip being generally vertical. This design of compactor is the subject of Patent Application Serial No. 1,427,003 to which the reader is referred for further details.

In another version of the invention, drive means for the platen are provided whereby the platen makes a vertical movement relative to a skip placed thereunder. Such a drive means may be constituted by an hydraulic ram mounted with its axis (line of applied force) vertical.

The compactor may be disposed in relation to the receiving and locating means so that the relative movement is linear. Alternatively the compactor is disposed in relation to the receiving and locating means so that the relative movement is arcuate, for example, circular.

According to one embodiment of this invention, a skip compaction facility is provided according to which a plurality of skip receiving locations are provided based circularly around a central point, and a compactor device is mounted so that it can be rotated to any one of a plurality of positions, in each of which it can compact the contents of a skip placed in one of the locations.

In an alternative embodiment of this invention, a linear skip support arrangement is provided whereby any selected one of a plurality of side-by-side skips can be brought into a position beneath a fixed compactor device. The linear skip support device may be a linear roller conveyor.

In yet another embodiment of this invention, a plurality of fixed skip supporting locations are provided and a

linearly movable compactor device is arranged so that it can overlies any selected one of the skips so supported. The compactor may be mounted on rails so that it can be moved linearly, and it may be driven by a rack and pinion drive, or any other suitable drive.

In an alternative version of the invention, a turntable is provided having means for carrying thereon a plurality of skips, and a compactor device is provided at one radial location of the turntable. It will readily be realised that with such an arrangement a skip can be compacted, the turntable rotated, the next skip compacted, and so on, as desired. The skips may be run on or off the turntable, at a non-compacting station, by suitably positioned rollers. The turntable may carry, three, or four, or five, or any other suitable number of skips, but four is the presently-preferred number.

The invention will be better understood from the accompanying drawings in which:

Figure 1 is a plan view of one example of the invention;

Figure 2 is a side elevation of the arrangement shown in Figure 1;

Figure 3 is a side elevation of an alternative embodiment of the invention;

Figure 4 is a plan view of a third embodiment of the invention;

Figure 5 is a cross-section of the arrangement shown in Figure 4;

Figures 6 and 7 are respectively side elevation and plan views of a fourth embodiment of the invention; and Figure 8 illustrates a fifth embodiment of the invention.

Referring to Figures 1 and 2, a compactor is illustrated at 10, having a pressure platen 12, a body 14, and a base 16. The platen is pivoted to the body by a horizontal pivot pin 18. The base 16 is supported on the ground by a vertical pivot pin 20 and a wheel or roller 22. The roller 22 is arranged to be driven by a motor 24. The motor may be electrical or hydraulic, or of any other convenient form. It will be realised that when the roller 22 is driven the compactor describes a circular path around the pivot 20, and so can take up any positions seen in Figure 1.

The arrangement includes receiving and locating means for skips, five such skips being illustrated at 24a-24e. Such means are in part formed by a plurality of concrete plinths 26, which are built adjacent to a series of skip-supports 28, each of which is in turn supported by suitable beams or girders 30. The skips are also located by lugs (28g) on the skip support. It will be seen from Figure 2 that the forward end 16a of the base 16 extends under a marginal part of a skip support 28c when the compactor 10 is in its pivotal position appropriate for

compacting the contents of the skip 24c. This engagement prevents the front end of the compactor 10 being lifted by the forces applied during compaction.

It will readily be seen that the compactor 10 can compress the contents of the five skips, in turn, and that while, for example the contents of skip 24a are being compacted, skip 24e which has been compacted could be removed by a known skip-transporter lorry and replaced by an empty skip.

The example of the invention shown in Figure 3 is similar to that in Figure 1 and 2 except that the compactor and the skip supports are sunk in pits or recesses so that the skips can be filled (e.g. by the general public who will bring the refuse to such a site) with the people who fill them having to ascend steps up to a plinth.

The example of the invention shown in Figures 4 and 5 is of an arrangement having receiving and locating means for 6 skips, and a compactor movable about a vertical pivot pin 30. The advantage of the Figure 4 arrangement is that it can be located near a boundary wall 32 and is economical of space. In other respects it resembles the arrangement of Figures 1 and 2.

Figures 6 and 7 illustrate an example of the invention in which the skip receiving and locating means is a turntable 82 rotatable about a vertical axis in relation to a stationary compactor 80. The turntable has a friction or other type of drive 84, and, as illustrated in Figure 6, is mounted in a pit 86 with its flat upper surface substantially co-planar with ground level 88. Railings 90 on the turntable define four skip-receiving locations. An extensible support 92 is provided to reduce the stress on the turntable during the application of compaction pressure and prevent the compactor lifting.

In an alternative embodiment of the invention, not illustrated, a pressure platen of the compactor can be carried by the piston of a hydraulic ram whose cylinder is mounted with its axis vertical on the cross-bar of a gantry. Such a gantry could be fixed in relation to rails which support the skips. Alternatively such a vertically-acting gantry-type compactor could be mounted on wheels or rollers.

In the various arrangements illustrated, a gantry with lifting means thereon may be provided for lifting and transporting the skips, and it will be understood that provision may be made for the public to tip extra refuse into skips that have already been compacted. In this way the extra skip volume made available can be fully utilised.

The word "ram" is used in this specification to mean any piston-cylinder or other linear powered actuator. While in this specification, reference has been made to

the design of compactor the subject of Patent 1,427,003, it will be appreciated that other compactors can readily be used in arrangements according to this invention.

5 Figure 8 illustrates a further embodiment of the invention, including a vertically reciprocable platen, carried by one of more rams, two being shown. In use the platen assembly is rotated around a vertical support post 98. It will be seen that one end 99 of the base of the compactor projects under the skip to prevent the compactor being lifted by the forces applied during compaction.

10 Reverting now to Figures 1 and 2, an important feature of this embodiment of the invention is the fact that the skip supports 28 and pivot 20 are in effect an integral part due to the use of the beams or girders 30. This allows one to reduce stress on the concrete foundations. In the absence of girders 30 and the overlap at 16a referred to, substantial foundations would be required to stop the skip supports 28 being torn out of the ground at the end near the compactor 10. It can be seen that if the girders 30 were not provided then one would require a large mass of concrete (e.g. 30 tons weight) holding down the support 28 to provide adequate reaction to the upward forces exerted at 16a when peak compaction force is exerted by the platen 12.

WHAT WE CLAIM IS:—

35 1. A compactor arrangement for compacting the contents of a skip as herein defined, including a compactor carried by a support structure and having a pressure platen, the pressure platen being mounted for movement generally downwardly and upwardly into and out of a skip, the arrangement also having: means, comprising a ground-based skip support separate from the support structure, for receiving and locating a plurality of skips, 40 means for effective relative arcuate or linear movement between the compactor and the receiving and locating means, and means between the support structure and the skip support for preventing the support structure being lifted as a result of the forces applied during compaction, whereby in use the 50

pressure platen of the compactor can be caused to make successive compacting strokes on different skips in turn.

2. An arrangement according to claim 1 in which the platen is constructed and mounted to perform in use an arcuate movement relative to a skip, the portion of said movement within the skip being generally vertical. 55 60

3. An arrangement according to claim 1 in which a drive means for the platen is provided whereby in use the platen makes a vertical linear movement into and out of a skip. 65

4. An arrangement according to claim 3 in which the drive means is a hydraulic ram mounted with the axis of its cylinder substantially vertical.

5. An arrangement according to any one of claims 1—4 in which the compactor is disposed in relation to the receiving and locating means so that the relative movement therebetween is circular. 70

6. An arrangement according to claim 3 or 4 in which the drive means is mounted on a gantry. 75

7. An arrangement according to claim 6 in combination with linear rails supporting the gantry, whereby the gantry can be moved relative to a series of side-by-side skips in a horizontal direction perpendicular to a line collinear with the common lateral centre line of the skips. 80

8. An arrangement according to claim 5 in which the compactor is stationary and means are provided for moving the skips relative thereto. 85

9. An arrangement according to claim 5 in which the receiving and locating means are provided on a rotatable turntable. 90

10. A compactor arrangement substantially as hereinbefore described with reference to, and as illustrated in, Figures 1 and 2, or Figure 3, or Figures 4 and 5, or Figures 6 and 7, or Figure 8 of the accompanying drawings. 95

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the design of compactor the subject of Patent 1,427,003, it will be appreciated that other compactors can readily be used in arrangements according to this invention.

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9. An arrangement according to claim 5 in which the receiving and locating means are provided on a rotatable turntable.

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