March 6, 1956 C. JACKSON 2,737,094

COMPACTOR FOR ASPHALTIC AND OTHER MATERIALS

Filed Aug. 14, 1951 2 Sheets-Sheet 1

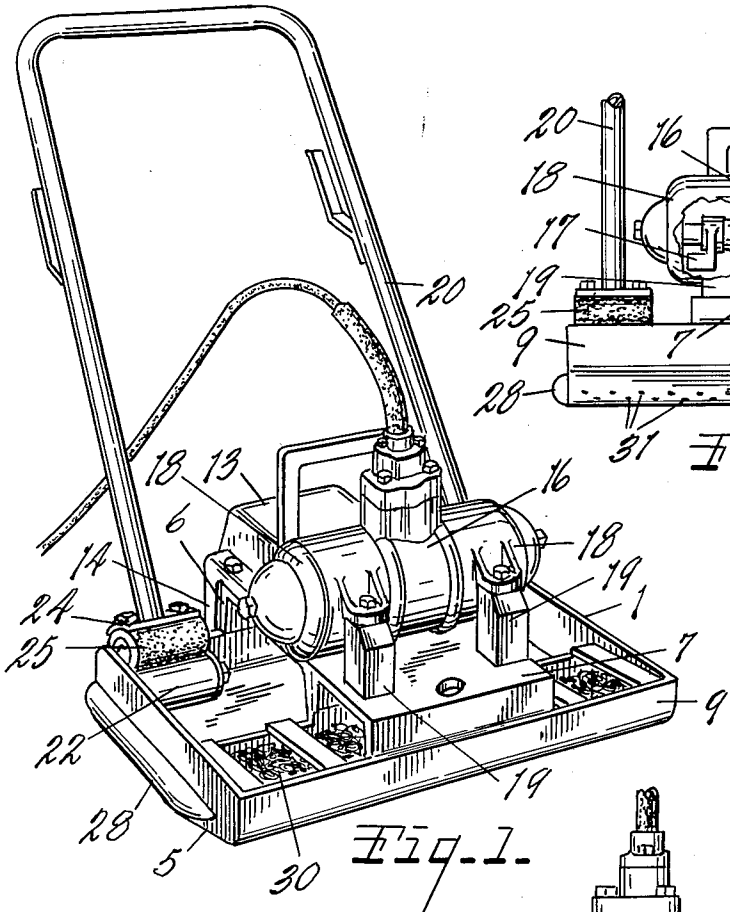


Fig. 1.

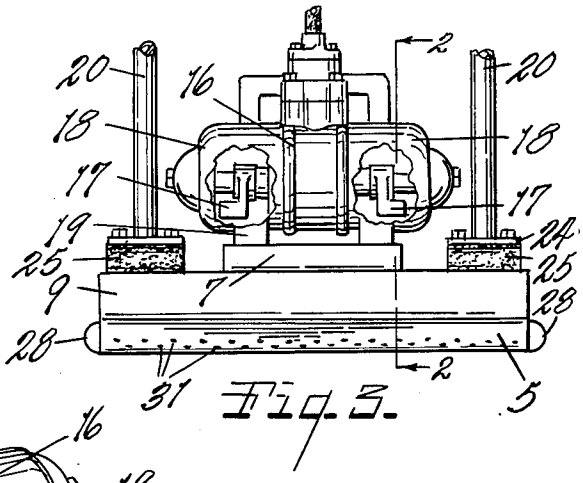


Fig. 3.

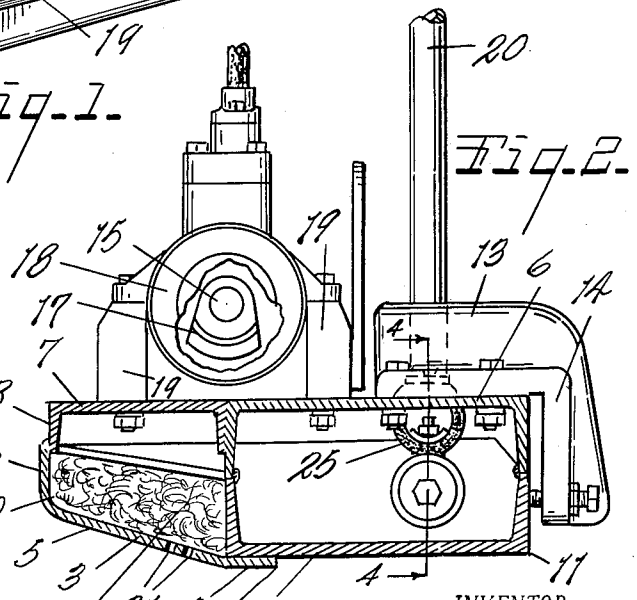


Fig. 2.

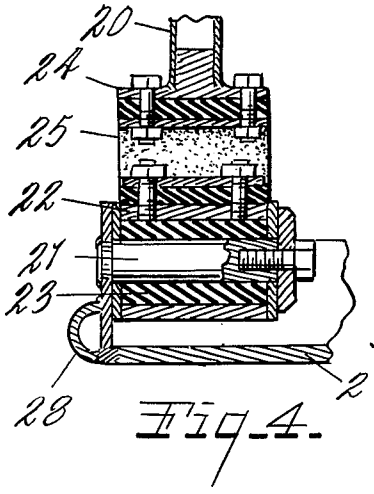


Fig. 4.

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COMPACTOR FOR ASPHALTIC AND OTHER MATERIALS

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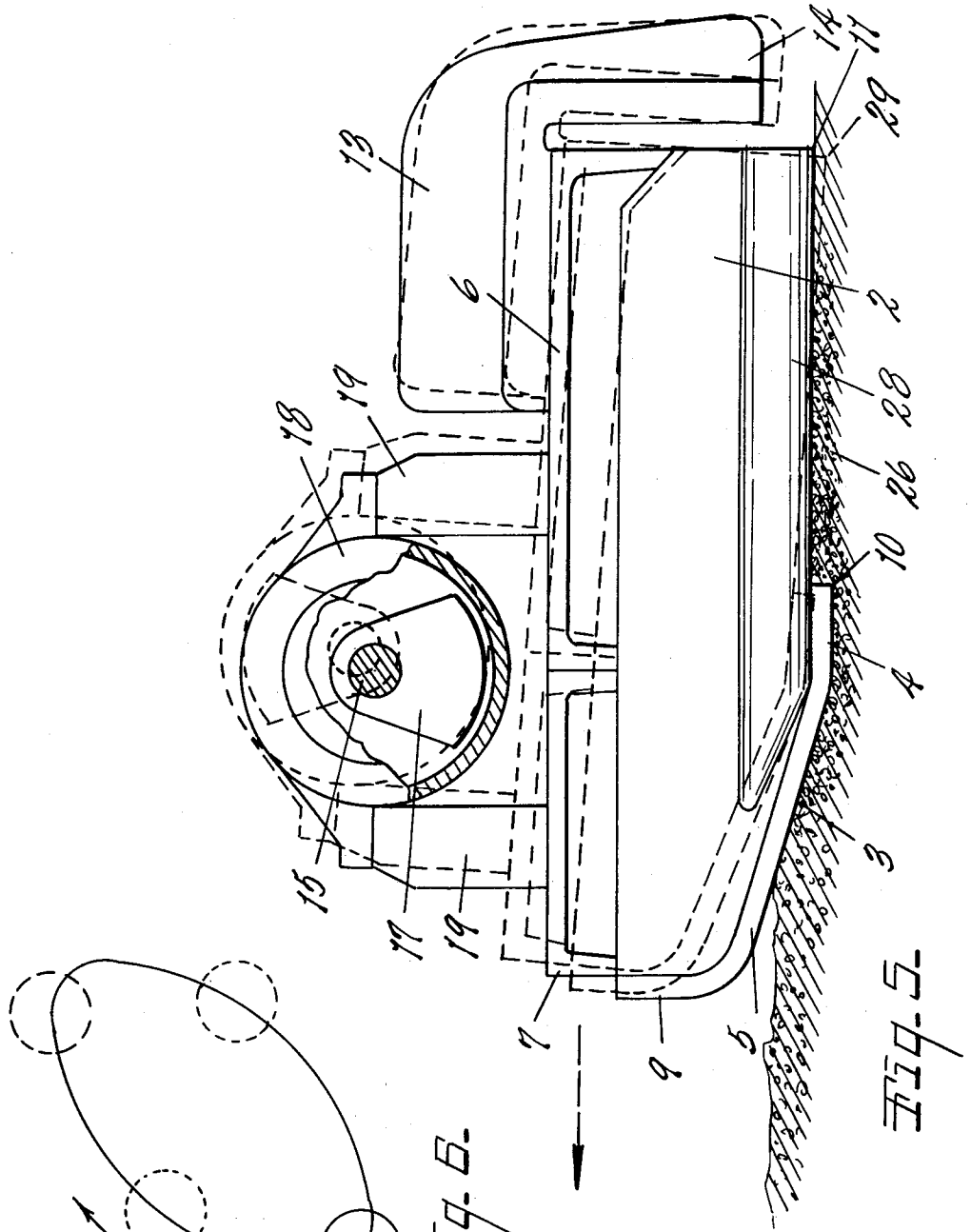


Fig. 5.

Fig. 6.

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COMPACTOR FOR ASPHALTIC AND OTHER MATERIALS

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Application August 14, 1951, Serial No. 241,720

8 Claims. (Cl. 94—48)

This invention relates to improvements in a compactor for asphaltic and other materials.

The main objects of this invention are:

First, to provide a compactor for asphaltic materials which is highly efficient.

Second, to provide a compactor for asphaltic and other materials which may be manipulated in use with a minimum of manual effort.

Third, to provide a compactor which may be used in compacting foundations and also for the surface compacting and finishing of the surface. It is particularly well adapted for use in compacting asphaltic surfaces for pavements, floors, walks and the like.

Fourth, to provide a structure having these advantages which is self-propelling.

Fifth, to provide a structure of the character described which is comparatively simple and economical in structure and at the same time very rugged.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is pointed out in the claims.

A preferred embodiment of this invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a front perspective view of a structure embodying my invention.

Fig. 2 is a fragmentary view in section on a line corresponding to line 2—2 of Fig. 3, certain parts being broken away and the handle being shown in upright position.

Fig. 3 is a fragmentary front elevational view of the structure as shown in Fig. 2.

Fig. 4 is an enlarged fragmentary view showing the details of the mounting for the handle.

Fig. 5 is an enlarged end elevational view showing the machine in operative relation to a pavement or slab being compacted, the vibratory movement being indicated by dotted lines and somewhat exaggerated for purposes of illustration.

Fig. 6 is a diagrammatic view illustrating the vibratory movement in a generally orbital path.

The machine illustrated in the accompanying drawings is an embodiment of my invention designed for manual manipulation. The machine is adapted for use in compacting foundations and also hot or cold asphaltic materials such as are used in the construction of floors, decks, pavements and the like.

The structure comprises a base designated generally by the numeral 1 and constituting a shoe, the shoe comprising a flat faced rear member 2 of upwardly facing channel section and a front member 3. The front member has a relatively narrow flat faced horizontal impact portion 4 underlapping the front portion of the rear member 2. The front member has a rearwardly inclined portion 5 merging with the impact portion 4. I refer to the portion 4 as an impact portion as in the embodiment illustrated this portion of the shoe impacts on the material with greater amplitude than other portions of the shoe. It should be understood, however, that all of the

shoe except such portions of the rearwardly inclined part 5 as may be out of contact with the material has an impacting or compacting engagement with the material placed.

The top members 6 and 7, which are desirably of downwardly facing channel section, are welded together side by side and the flanges of the member 6 are welded to the flanges of the member 2. The upturned front edge 9 of the member 3 is welded to the front flange 8 of the member 7. The rear edge of the impact portion 4 of the front member, which is lapped upon the under side of the member 3, provides a rearwardly facing shoulder 10. The rear end 11 of the member 2 provides a rearwardly facing shoulder for the shoe.

A weight 13 is mounted on the top member 6 and has a depending arm portion 14 which depends at the rear of the shoe. The purpose of this weight is to weight the structure and provide a center of gravity well toward the rear of the machine and in fact in this embodiment at the rear of the machine and below the axis of the unbalanced rotor 15. This arrangement results in the greatest amplitude of vibration at the front or forward part of the shoe.

The means for vibrating the shoe at the high frequency illustrated comprises an electric motor 16, the rotor shaft 15 of which is provided with unbalancing weights 17 which are spaced substantially from the central longitudinal or front to rear plane of the machine. The housing 18 which constitutes part of the vibrating unit is mounted on the blocks 19 which are securely attached to the top members of the base. It will be noted that the axis of the rotor is in approximately vertical alignment with the impact portion 4 of the shoe and is substantially in advance of the transverse center of the shoe.

The handle 20 is pivotally mounted on the studs 21 preferably through sleeves 22 having rubber bushings 23 therein. The handle is yoke shaped with its arms terminating in flanges 24 which are bolted to the connecting shock absorbing members 25. These are desirably formed of sections of rubber tubing or rubber hose. In Fig. 5 I illustrate a material 26 being compacted and the vibratory oscillation movement is illustrated by dotted lines.

As pointed out, the front member 3 is connected in lapping relation to the rear member 2 of the shoe, providing a shoulder 10 which extends transversely across the shoe. This is a feature of importance in securing an effective and quite rapid self-propelling travel. In the applicant's commercial embodiments, as shown in the accompanying drawings, the machine has a self-propelling speed with a rotor speed of 4000 R. P. M. of approximately 25 feet per minute, and the operator is merely called upon to steer the machine by means of the handle 20. This enables the operator to walk upon the compacted material and reduces the manual effort mainly to steering. To facilitate turning of the machine and to prevent gouging of the compacted surface, I provide the ends of the shoe with longitudinally disposed curved ribs 28 which merge into the face of the shoe as is shown in Fig. 4.

By positioning the axis of the vibrating motor and the center of gravity in the general relation described, the greatest amplitude of vibration is at the front of the machine, and owing to the shape of the front shoe member, the impacts upon the material are largely through the relatively narrow impact portion 4. As the machine vibrates under the impulses of its unbalanced rotor it travels forwardly.

I have indicated at 29 that the heel 11 of the shoe tends to bite into the compacted surface and therefore prevents any substantial rearward movement as the unbalancing weight rotates. The tendency of the machine

is to oscillate or vibrate in an orbital path which I have diagrammatically indicated in Fig. 6.

To lubricate the material which is being compacted, the base is provided with a reservoir 30. The inclined portion 5 of the front member 3 of the shoe constitutes the bottom of the reservoir. A series of discharge openings 31 are provided in advance of but desirably adjacent to the impact portion 4 to discharge lubricant such, for example, as kerosene, upon the material being compacted. The reservoir contains a lubricant absorbing and retaining means such as waste indicated at 32 and being subject to the vibration impulses, the lubricant is gradually and quite uniformly fed through the discharge openings 31 upon the material as the machine is advanced thereover. This liquid lubricant prevents the adhering of material such as asphalt to the shoe. While kerosene is suitable, there are many other liquids that may be used.

By providing two unbalancing weights uniformly spaced axially on the rotor shaft relative to the longitudinal center of the machine, the machine travels in a substantially straight line and, as stated, is self-propelling so that all the operator has to do is to steer the machine and the compaction of the asphaltic material is such that the operator can walk upon the compacted material.

The machine is highly efficient, two passes over the work resulting in as high a degree of compaction as a much larger number of passes of a roller weighing several tons. While the machine is especially desirable for the compacting of asphaltic materials, it is also desirable for use in compacting foundation materials such as crushed rock and in working the so-called "fines" into the foundation as is a quite common practice in the laying of pavements, floors and other slabs.

I have illustrated my invention in one highly practical commercial embodiment thereof. I have not attempted to illustrate or describe other embodiments of my invention as it is believed that this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a machine of the class described, the combination of a vibratory base constituting a shoe and comprising a flat faced rear member, a front member having a relatively narrow flat faced horizontally disposed impact portion underlapping the said rear member at the front thereof and having a front portion rearwardly inclined relative to the front end of the shoe and merging into its said impact portion, the rear edge of said impact portion constituting a rearwardly facing shoulder extending transversely of the face of the shoe, the rear edge of the rear member constituting a work engaging heel spaced substantially rearwardly of said shoulder, said shoe having longitudinally disposed curved ribs at the ends thereof merging into the face of the shoe, a rotor having axially spaced unbalancing weights mounted on said shoe with its axis disposed transversely thereof in substantially vertical alignment with the impact portion of said shoe front member and substantially in advance of the transverse center of the shoe, a weight mounted on said base with its center of gravity at the rear of the shoe and in a horizontal plane substantially below the horizontal plane of the rotor axis, and a handle having pivotal vibration absorbing connections to said base adjacent the rear end thereof.

2. In a machine of the class described, the combination of a vibratory base constituting a shoe and comprising a flat faced rear member, a front member having a relatively narrow flat horizontally disposed impact portion underlapping the said rear member at the front thereof and having a front portion rearwardly inclined relative to the front end of the shoe and merging into its said impact portion, the rear edge of said impact portion constituting a rearwardly facing shoulder extending transversely of the face of the shoe, the flat face of the rear member and the flat face of the impact portion of the front member providing work engaging faces, the work engaging face of the impact portion of the front member being downwardly offset relative to the forward portion of the work engaging face of said rear member, the rear edge of the rear member constituting a work engaging heel spaced substantially rearwardly of said shoulder, and an unbalanced rotor mounted on said shoe with its axis disposed transversely thereof and approximately vertically above the impact portion of the front member and substantially in advance of the transverse center of the shoe, the center of gravity of the structure being at the rear of the transverse center of the shoe.

3. In a machine of the class described, the combination of a vibratory shoe including a flat rear portion providing a flat work engaging face and a flat horizontally disposed front impact portion providing a flat work engaging face, the rear edge of the impact portion constituting a rearwardly facing shoulder extending transversely across the shoe in substantially spaced relation to its rear edge, the rear portion of the work engaging face of said impact portion being disposed on a level below that of the forward portion of the work engaging face of said rear portion, the rear edge of the shoe constituting a work engaging shoulder when the shoe is vibratingly oscillated, said shoe having an upwardly inclined front portion in advance of its said impact portion, vibratory means comprising a rotor having axially spaced unbalancing weights disposed with its axis transversely of the shoe and substantially in the vertical plane of said impact portion thereof, and weighting means on said shoe, the center of gravity of which is spaced substantially rearwardly from the axis of said rotor.

4. In a machine of the class described, the combination of a vibratory shoe including a flat rear portion and a flat horizontally disposed front portion, said shoe having an upwardly inclined front portion in advance of its said flat front portion, means for vibrating said shoe at high frequency, and a liquid feed reservoir subject to the vibratory impulses of the shoe having discharge openings through the shoe in advance of the said flat front portion of the shoe.

5. In a machine of the class described, the combination of a vibratory shoe comprising a rear portion of substantial area and a relatively narrow horizontally disposed impact portion at the front of said rear portion and a front portion rearwardly inclined relative to the front end of the shoe and merging into said impact portion, said rear, impact and inclined front portions each providing a work engaging face, the rear end of the work engaging face of the impact portion being downwardly offset relative to the forward portion of the work engaging face of said rear portion, there being a rearwardly facing shoulder extending transversely of the face of the shoe at the rear of its said impact portion, the rear edge of the shoe constituting a work engaging heel when the shoe is tilted, and means for vibrating said shoe comprising an unbalanced rotor mounted thereon with its axis transversely thereof and in approximately vertical alignment with the impact portion of the shoe and in advance of the transverse center thereof, the center of gravity of the shoe and the parts carried thereby being at the rear of the transverse center of the shoe and in a plane below the horizontal plane of the axis of the rotor.

6. In a machine of the class described, the combination of a vibratory shoe having a relatively narrow horizontally disposed impact portion at the front thereof and a front portion rearwardly inclined relative to the front end of the shoe merging into its said impact portion, an unbalanced rotor mounted on said shoe with its axis disposed transversely thereof and in approximately vertical alignment with the said impact portion, and a lubricant feed means carried by the shoe and discharging in advance of said impact portion.

7. In a machine of the class described, the combination of a shoe having a front portion rearwardly inclined relative to the front end of the shoe, said rearwardly inclined front portion having a series of liquid discharge openings therein, a liquid reservoir on said shoe in communication with said discharge openings, and means carried by said shoe for imparting high frequency vibrations thereto.

8. In a machine of the class described, the combination of a shoe having a front portion rearwardly inclined relative to the front end of the shoe, means for vibrating said shoe at high frequency and propelling the shoe forwardly by vibration of the shoe, and a reservoir carried by said shoe, said front portion constituting the bottom of the liquid reservoir and having a series of discharge openings therein.

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