United States Patent

Waschulewski et al.

[15] **3,636,834**

[45] **Jan. 25, 1972**

[54] IMPLEMENT WITH VIBRATING TOOL

[72] Inventors: **Hans-Georg Waschulewski,** Mettmann; **Hans Baumers,** Hubbelrath; **Hans-Reinhard Lambertz,** Hochdahl, all of Germany

[73] Assignee: **Losenhausen Machinenbau AG,** Dusseldorf, Germany

[22] Filed: **Nov. 19, 1970**

[21] Appl. No.: **91,021**

[52] **U.S. Cl.** **94/49**

[51] **Int. Cl.** **E01c 19/30**

[58] **Field of Search** 94/49, 48

[56] **References Cited**

UNITED STATES PATENTS

3,538,821 11/1970 Baeumers et al. 94/49

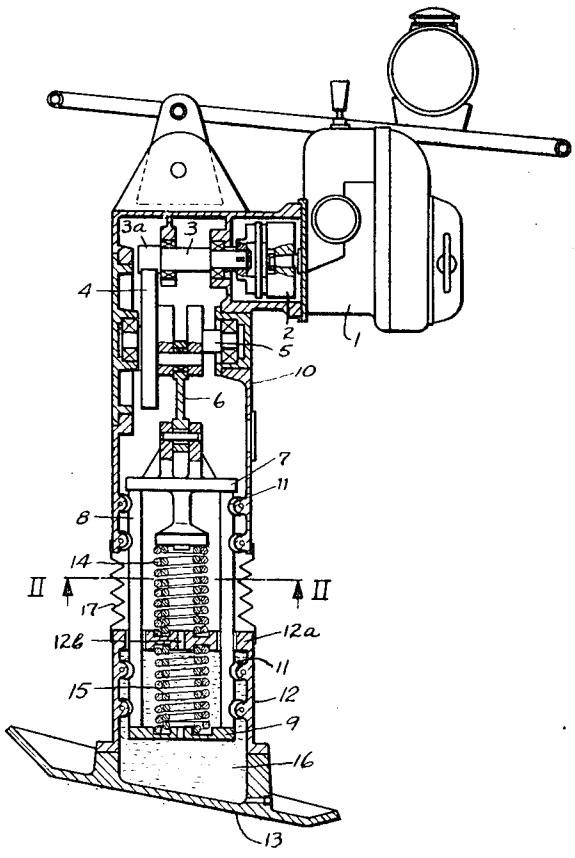
Primary Examiner—Jacob L. Nackenoff

Attorney—Darbo, Robertson & Vandenburgh

[57] **ABSTRACT**

A prime mover is mounted on a main implement frame. A crank in the main frame is connected by a gear drive to the prime mover to be rotated thereby. In one embodiment, the crank is in a lower chamber in the main frame and the gear drive is in an upper, oil-filled, chamber in the main frame. Positioned a spaced distance from the lower end of the main frame is a housing having an internal chamber which, in another embodiment, is filled with oil. A bellows encloses the space between the housing and the main frame. An oil aperture extends through the top of the housing to the space within the bellows. A reciprocating frame comprises three rods supported by rollers for longitudinal movement in the lower chamber of the main frame and in the upper, adjacent, wall of the housing. The rollers are on the outside of the rods and are grooved to fit the rods. The rods are positioned 120° apart. The reciprocating frame has a crossmember within the main frame at the upper ends of the rods, and a plate within the housing at the lower ends of the rods. The upper crossmember is connected to the crank so as to reciprocate the reciprocating frame. A compression spring extends between the upper crossmember and the upper wall of the housing. A second compression spring extends between the upper wall of the housing and the plate in the housing. The bottom of the housing forms a tamping foot.

5 Claims, 4 Drawing Figures



PATENTED JAN 25 1972

3,636,834

SHEET 1 OF 2

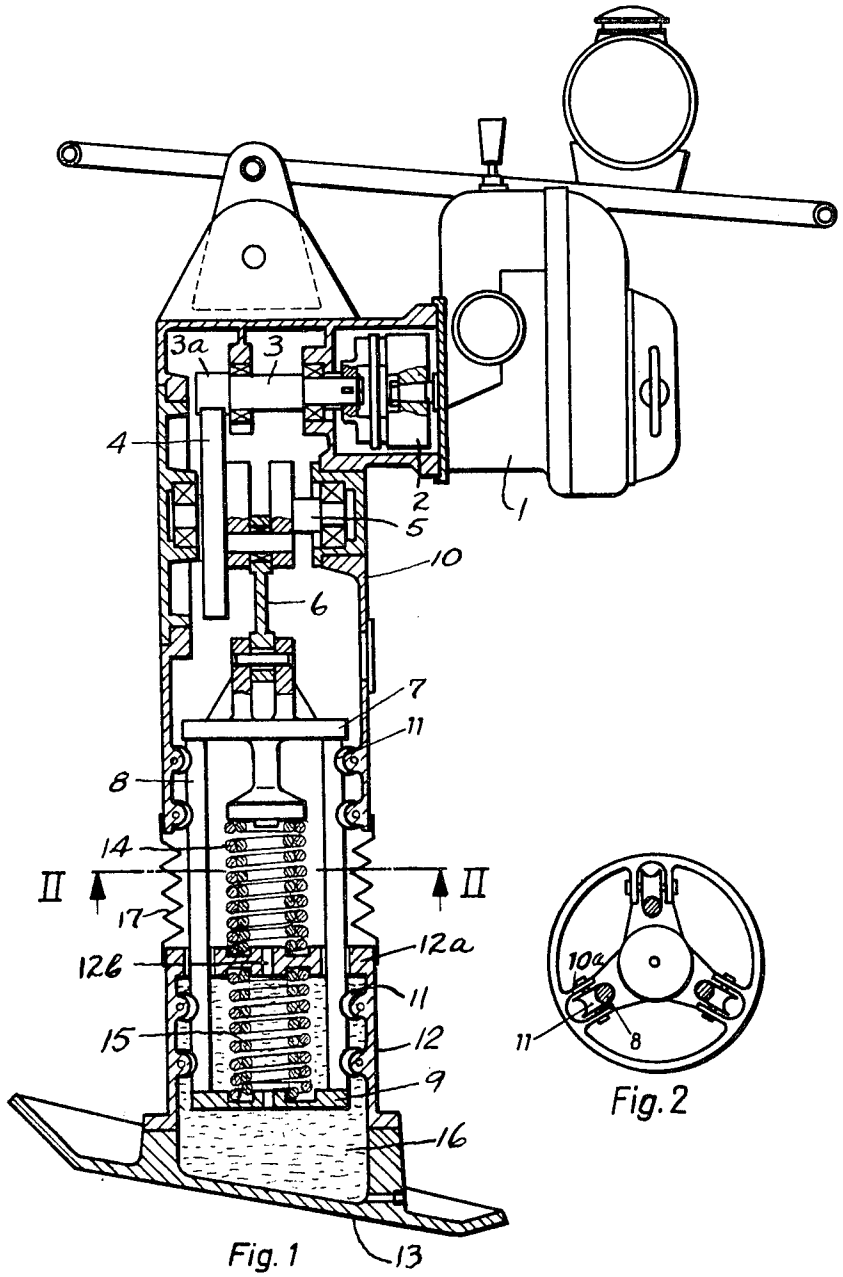


Fig. 1

Fig. 2

HANS-GEORG WASCHULEWSKI
HANS BAUMERS
HANS-REINHARD LAMBERTZ

INVENTORS

BY
Darbo, Robertson & Vandenburgh

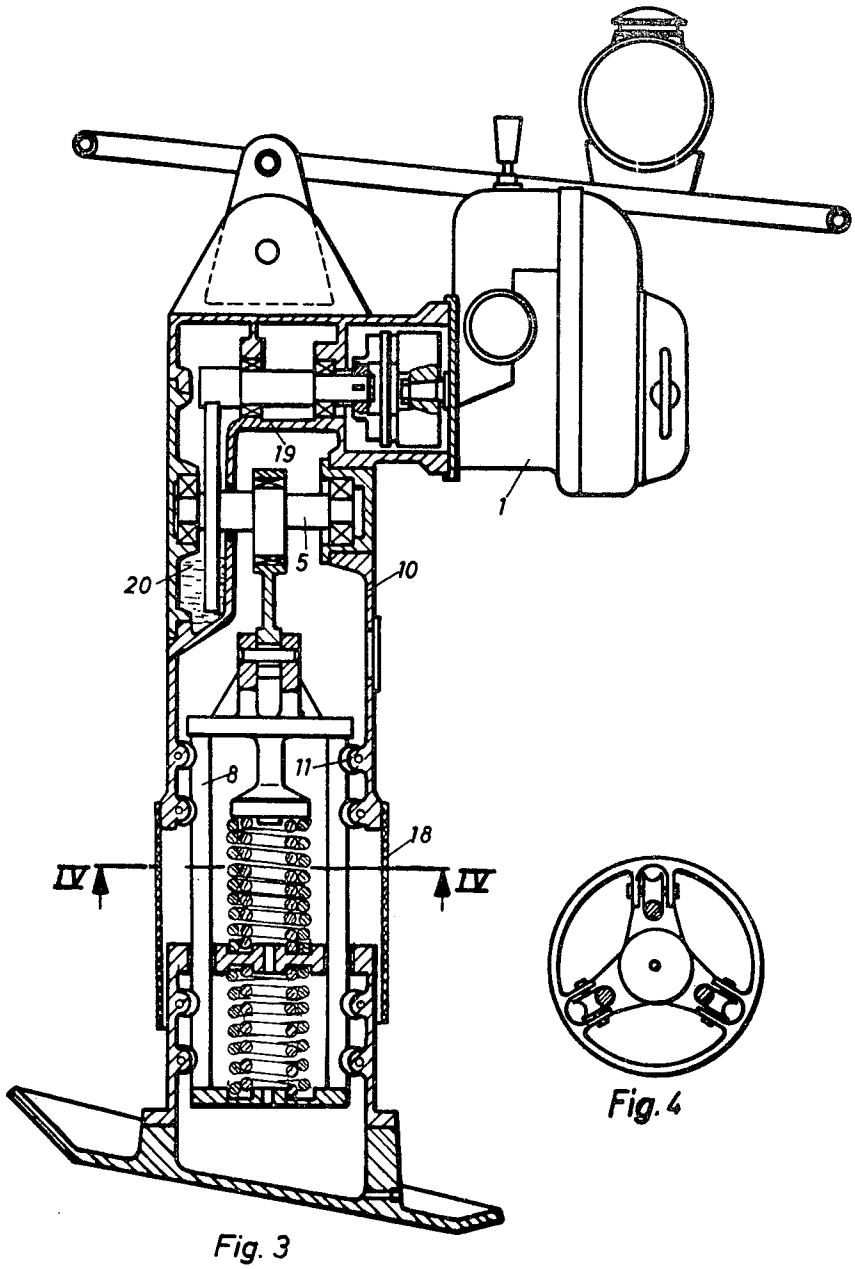


Fig. 3

Fig. 4

IMPLEMENT WITH VIBRATING TOOL

BACKGROUND AND SUMMARY OF THE INVENTION

The parent patent U.S. Pat. No. 3,538,821 relates to an implement with a vibrating tool, more particularly a tamper, in which the tool is set into vibration by a prime mover via a crank drive and a spring system comprising a pair of compression springs or compression spring sets adapted to operate in opposition, wherein a frame of a plurality of parallel rods is associated with the crank drive, said rods being joined to one another at the top and bottom by transverse members and guided at the top in guides disposed in the implement housing, the tool having a housing part which encloses the lower end of the frame with the crossmember and is guided with guides on the rods and whose upper closure forms the abutment for the compression springs. In the arrangement disclosed in the parent patent the rods are guided in sliding bushings.

It is an object of the invention to provide the machine, assembly, servicing and repairing of the guide of the rods in an implement as set forth in the parent patent.

To this end according to the invention the guides for the rods in the implement housing and the housing part on the tool are formed by roller guides. This feature simplifies manufacture. A precision casting probably is sufficient for the insertion of the rollers. At worst, the openings for the roller shafts can be drilled with a normal spiral drill. Rolling friction reduces friction losses. The implement can be more readily serviced. The wear allowance for rollers is greater than for sliding bushings. If the rollers should have to be repaired, they can readily be interchanged as worn parts by the user of the implement.

Advantageously the arrangement according to the invention is such that the frame has three rods which are offset by 180° from one another and are each guided at the top and bottom in a pair of rollers which are formed with peripheral grooves, bear radially against the rods from outside and are mounted on the implement housing and the housing part of the tool. The rollers can be made of wear-resistant plastics, e.g., nylon or Teflon.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a vertical section through an implement according to the invention;

FIG. 2 is a section, taken along the line II—II in FIG. 1;

FIG. 3 is a section, similar to FIG. 1, through another embodiment of an implement according to the invention; and

FIG. 4 is a section, taken along the line IV—IV in FIG. 3.

DESCRIPTION OF SPECIFIC EMBODIMENTS

The following disclosure is offered for public dissemination in return for the grant of a patent. Although it is detailed to ensure adequacy and aid understanding, this is not intended to prejudice that purpose of a patent which is to cover each new inventive concept therein no matter how others may later disguise it by variations in form or additions or further improvements. The claims at the end hereof are intended as the chief aid toward this purpose, as it is these that meet the requirement of pointing out the parts, improvements, or combinations in which the inventive concepts are found.

A prime mover **1** drives a pinion shaft **3** via a flexible centrifugal clutch **2**. Shaft **3** has a pinion **3***a* which meshes with a gear **4** connected to a crankshaft **5** mounted in the implement housing or main frame **10**. The crankshaft **5** drives via a connecting rod **6** attached to a reciprocating frame which comprises an upper crossmember **7**, three vertical rods **8** and a lower crossmember **9**. Rods **8** of the reciprocating frame are guided in the implement housing or main frame **10** by pairs of guide rollers **11**. Similar rollers **11** guide the rods **8** in a housing part **12** of a tamper **13**. The upper closure **12***a* of the housing part **12** acts as a spring abutment for two sets **14**, **15** of compression springs which bear on the one hand against the closure **12***a* and on the other against the top and bottom transverse members **7** and **9** of the reciprocating frame. The oscillatory motion of the reciprocating frame is transmitted to the tool **13** via the spring sets **14**, **15**. The implement housing **10** and the housing part **12** are interconnected in sealingtight relationship, with provision for movement in relation to one another, by folding bellows **17**.

The housing part **12** has an oil filling **16**. The bottom transverse member **9** is formed by a plate **9** which substantially fills the cross section of the casing part **12**. The upper closure of the housing part **12** has a central aperture **12***b*. When the tool **13** and the frame make a relative oscillatory motion in relation to one another, the lower crossmember **9** acts as a pump piston and injects oil through the upper aperture **12***a* into the implement housing **10** as far as the guide rollers **11** for the frame.

As can be seen from FIG. **2**, the guide rollers are offset by 120° in relation to one another. They are mounted between attachments **10***a* of the implement housing **10** and extend radially inwards after the fashion of a fork. A similar mounting is provided for the rollers **11** in housing part **12**. The rods **8** of the frame are also offset by 120° in relation to one another. The rollers **11**, which are formed with peripheral grooves of circular cross section, bear against the rods radially from outside. In this way the frame is reliably guided between the rollers **11**.

As shown in FIG. **3**, with roller guiding, oil lubrication for the rollers can, if necessary, be omitted. The rods **8** therefore run dry in the rollers **11**. The folding bellows **17** is then omitted and a simple nonsealing cover **18** can be substituted. Another modification illustrated in FIG. **2** is that the implement housing **10** is subdivided by a partition **19** into two chambers. One chamber contains the transmission between the motor and the crankshaft **5** and contains a lubricating oil filling **20**. The other chamber, the remainder of the space in housing **10**, does not have a lubricating oil filling.

We claim:

1. In an implement comprising a main frame, a prime mover mounted on the frame, a crank drive mounted on the frame and connected to the prime mover to be driven thereby, a vibrating tool, a housing part supporting said tool, a reciprocating frame having guide rods and connected to said drive, springs resiliently between the housing part and the reciprocating frame, and means guiding the reciprocating frame in the main frame and in the housing part, the improvement wherein said means comprises rollers rotatably mounted on the main frame and on the housing part and contacting said guide rods.

2. In an implement as set forth in claim **1**, wherein there are three of said rods positioned 120° from each other, said rollers have peripheral grooves and are positioned to bear against the outside of the rods.

3. In an implement as set forth in claim **2**, wherein said rollers are made of wear-resistant plastic.

4. In an implement as set forth in claim **3**, wherein said main frame is divided into two chambers, said crank drive and a part of said reciprocating frame being in one of said chambers, and including a gear drive connecting said prime mover and said crank drive and positioned in the other chamber, and a lubricating oil filling in said other chamber.

5. In an implement as set forth in claim **1**, wherein said main frame is divided into two chambers, said crank drive and a part of said reciprocating frame being in one of said chambers, and including a gear drive connecting said prime mover and said crank drive and positioned in the other chamber, and a lubricating oil filling in said other chamber.

* * * * *