May 13, 1930. E. P. BURRELL ET AL 1,758,647

SURFACING UNIT

Original Filed Oct. 21, 1927

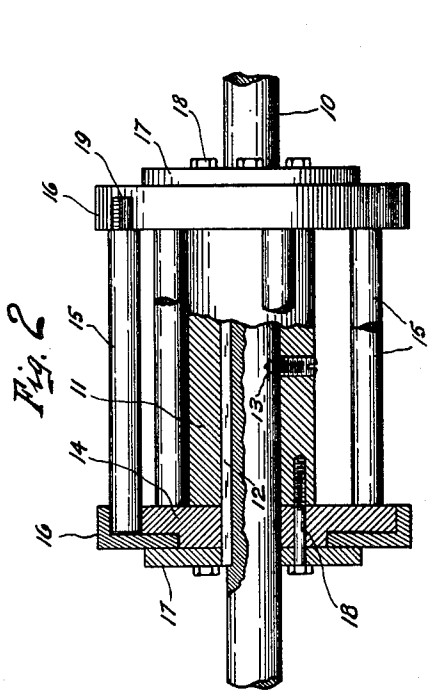


Fig. 2

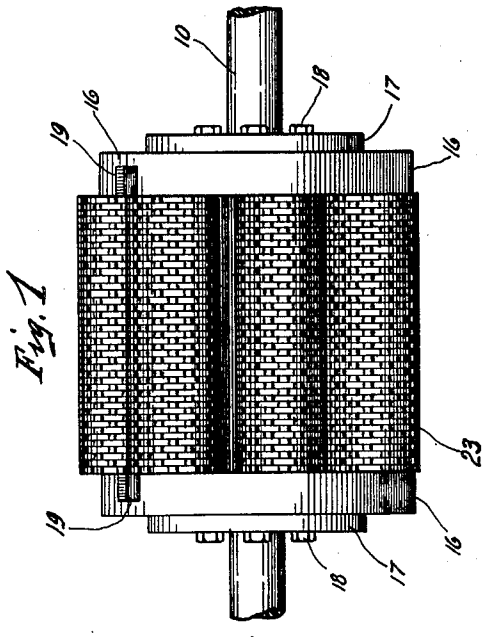


Fig. 1

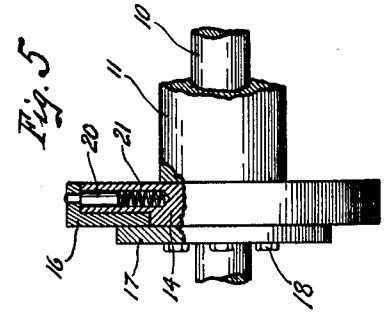


Fig. 5

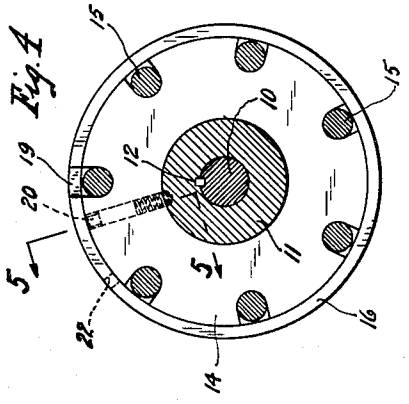


Fig. 4

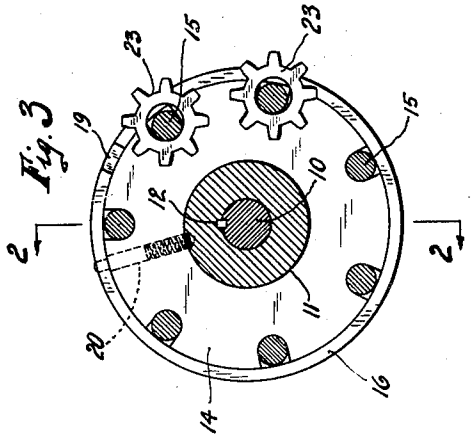


Fig. 3

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Patented May 13, 1930 1,758,647

UNITED STATES PATENT OFFICE

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SURFACING UNIT

Original application filed October 21, 1927, Serial No. 227,768. Divided and this application filed June 29, 1928. Serial No. 289,294.

This invention relates to a surfacing unit adapted particularly for use in machines for cleaning the surfaces of brick and like objects by the action of cutting or abrading members presented to the surfaces of the articles to be cleaned. This application is a division of our prior application Serial No. 227,768, filed October 21, 1927.

The principal object of the present invention is to provide a surfacing member in the form of a rotatable unit which is so constructed and arranged that it is composed of a plurality of groups of cutters or surfacing members supported in a manner such that they may be easily and quickly replaced when they become worn from use.

A further object is to support the surfacing members in groups on a plurality of circumferentially spaced axially disposed rods constituting a part of a revoluble drum or head, with the rods so supported and secured in place that they may be readily removed or placed in position.

A further object is to provide a unit having provision for quick removal and replacing of cutters and for rigidly and securely holding the cutter supports in place.

A still further object is to provide a unit of this kind with the cutters or surfacing members arranged so as to be most effective and which is strong and durable.

The above and other objects are attained by the invention which may be here briefly summarized as consisting in certain novel details of construction and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

In the accompanying sheet of drawings wherein we have illustrated the preferred embodiment of the invention, Fig. 1 is a side elevation of the surfacing unit; Fig. 2 is a view partly in section and partly in elevation with the cutters or surfacing members removed from the supporting rods, the section being taken substantially along the line 2—2 of Fig. 3; Fig. 3 is a transverse sectional view omitting the cutters from part of the rods and showing the position of the cutters on the rods when the unit is in rotation; Fig. 4 is a view similar to Fig. 3 but showing a retaining ring displaced from the position shown in Fig. 3 so as to permit the application or removal of one of the rods; and Fig. 5 is a fragmentary view partly in section and partly in elevation, showing the locking pin for holding the retaining ring in its normal or operative position, the section being taken substantially along the line 5—5 of Fig. 4.

Referring now to the drawings, 10 represents the rotatable shaft which supports the surfacing unit, in this instance a cleaning or abrading unit, and which may constitute part of a cleaning machine, such as a brick cleaning machine with which one or more of the cleaning units are to be employed. Generally, though not necessarily, the machine will have a table with an opening through which the abrading members project so as to clean or abrade the surfaces of the articles moved across the table over the opening. However, the present invention is not limited either to a brick cleaning machine or to a machine having the characteristics or parts referred to.

As before stated, the surfacing unit is in the form of a revoluble drum or head carrying a plurality of groups of circumferentially spaced cutters. These members are preferably loosely mounted on the supporting rods so as to have suitable play in the radial direction and so that they may be moved outwardly by centrifugal force when the shaft 10 and the unit are rotated. It is characteristic of a unit of this kind that although the cutters or cutting disks are formed of very hard material the wear on them is excessive, requiring rather frequent renewal, and it is a feature of the present invention that the unit is so constructed as to permit the quick and easy replacement of the cutters by reason of the manner in which the cutter supporting rods are mounted and secured in place.

By reference to the different figures of the drawings, it will be seen that the drum includes a sleeve 11 which is keyed or otherwise secured thereto. In this instance it is secured to the shaft by a key 12 and by a set screw 13. The function of the former is to insure its rotation with the shaft and the set screw serving chiefly to hold the unit against

endwise movement on the shaft. At the ends of the sleeve 11 there are two disks 14 which are also keyed to the shaft preferably by the same key 12. These disks are provided at their peripheries with equally spaced notches and in these notches are the ends of the cutter supporting rods 15 which rods extend between the disks forming the equivalent of a drum in parallel relation, these rods being equally spaced from each other by reason of the equal spacing of the notches and being located a uniform distance from the axis of the shaft 10.

The rods 15 are normally held in place against outward movement by a pair of flanged retaining rings 16 having laterally extending flanges overlying the notches of the disks 14 and having also inwardly extending flanges which are engaged by retaining disks 17, the disks 14 and 17 being secured together by screws 18 passing axially through the disks and into the ends of the sleeve, as best illustrated in Fig. 2. The disks 14 are stepped or shouldered, as illustrated, so as to leave between them and the retaining disks 17 annular grooves which receive the inwardly extending flanges of the retaining rings 16, and enable these rings to be turned on the end members or flanges of the drum.

The laterally extending flanges of the rings 16 are each provided, as clearly illustrated in Figs. 1, 2, 3 and 4, with a notch or opening 19 wide enough to permit the passage therethrough of the ends of the cutter supporting rods 15. It is obvious that when the openings 19, which are normally opposite or in line with each other, axially considered, are positioned over a pair of peripheral notches in the disks 14, a cutter supporting shaft may be inserted or removed, as indicated in Fig. 4, which shows one of the retaining rings positioned with its notch 19 in line with one of the notches of the disk 14, as when the shaft is to be applied or removed. By turning the retaining rings step by step so as to successively position the notches 19 over the pairs of peripheral notches of the disks 14, all of the cutter supporting rods can be successively inserted or removed. It is to be noted that when the retaining rings are positioned so that one rod 15 may be removed or inserted, the other rods are securely held in place by the rings. After the cutter supporting rods are in position with their cutters, the retaining rings 16 are positioned as illustrated in Fig. 3 with the openings 19 half way between two notches of the disks 14 so that the cutter supporting rods will be securely held in place against being thrown outwardly by centrifugal force. Each retaining ring is normally locked against rotational movement on the disks 14 by a spring actuated locking pin 20 seated in a radial socket of the disk 14 and pressed outwardly by a spring 21 seated in the socket beneath the pin. The pin as here illustrated is provided with a reduced end which is adapted to engage in an opening 22 provided in the retaining ring so as to normally hold the latter in the position illustrated in Fig. 3, i. e., with the opening 19 substantially midway between a pair of cutter rods. When it is desired to change the cutters and therefore to remove the cutter supporting rods, the locking pins 20 are pressed inward so as to disengage the outer ends of the pins from the openings 22 and then both the rings are turned from the position shown in Fig. 3 so as to successively position the openings 19 opposite the ends of the cutter supporting rods, as stated above. In some cases depending upon the nature of the cutters and length of the rods only one retaining ring need be used or adjusted in the removal or insertion of any of the rods.

The cutters 23 in this instance are in the form of disks loosely mounted on the rods 15. They are formed of special, hard metal and are provided with toothed peripheries so that they will have a good abrasive action on the bricks or other articles to be cleaned. They are provdied also with centrally disposed openings which loosely receive the rods 15 so that under the action of centrifugal force they will be thrown radially outward far enough that they may project through an opening in the table or other member over which the articles to be cleaned are moved so as to have the desired abrading action on the faces of the articles to be cleaned.

In Fig. 3, the two cutters illustrated are in the most outward position which they occupy when the cutting unit is in operation and is being rotated at high speed. It will be obvious that by providing in the cutters central openings somewhat larger than the rods which support the cutters, the cutters may turn freely on the rods and may yield inwardly somewhat as the bricks or other articles are being moved past them in the cleaning operation.

The construction of the surfacing unit described above not only has the advantage of ease of removal or insertion of the rods supporting the groups or cutters, but the construction has been found in practice to hold the cutter rods rigidly in place and to be absolutely safe against accidental disengagement of the parts when rotated at high speed and the unit as a whole is strong and durable, it being only necessary to replace the cutters when they become worn, and this can be done quickly and easily, as explained above.

While we have shown the preferred construction, we do not desire to be confined to the precise details or arrangements shown nor to the specific type of surfacing machine referred to, but aim in our claims to cover all modifications which do not involve a depar-

ture from the spirit and scope of our invention.

Having thus described our invention, we claim:

1. In a unit such as described, a pair of end members, rods extending between them and provided with surfacing members, and adjustable means for permitting the removal of or to hold the rods in place, said means comprising a single retaining member supported by one of the end members and movable thereon.

2. A unit such as described composed of a pair of end members spaced apart, rods having surfacing members thereon extending between the end members and having their ends fitted in openings in the end members, and a retaining member movably supported on an end member so as to permit the removal or insertion of the rods and normally holding the rods in place.

3. A surfacing unit comprising a pair of disks spaced apart, rods extending between the disks and supported at their ends by the latter, surfacing means carried by the rods, and a retaining member movably mounted on a disk and serving to normally hold the rods in place and when moved on the disk, to permit the removal of the rods.

4. A surfacing unit comprising a pair of spaced end members, rods provided with surfacing members having their ends supported by said end members, at least one having notches receiving the ends of the rods, and an annular retaining member supported on the notched end member and normally covering the notches and the ends of the rods and movable so as to permit the removal or insertion of the rods.

5. A surfacing unit comprising a pair of spaced end members, rods having surfacing members extending between and supported by the end members, means for holding the rods in place and for permitting their removal comprising an annular retaining member supported on one of the end members and movable thereon, and means for normally securing the retaining member in position to hold the rods in place.

6. A surfacing unit comprising a pair of spaced end members, rods having surfacing members extending between and supported by the end members, means for holding the rods in place and for permitting their removal comprising an annular retaining member supported on one of the end members and movable thereon, and a locking pin for normally securing the retaining member in position to hold the rods in place.

7. A surfacing unit comprising a pair of spaced disks, rods extending between the disks and at their ends supported thereby, surfacing members on the rods, means for normally holding the rods in place and for permitting their removal comprising an annular retaining member on one of the disks and movable thereon, and means for normally holding the retaining member in rod retaining position.

8. A surfacing unit comprising a pair of spaced disks, rods extending between the disks and at their ends supported thereby, surfacing members on the rods, means for normally holding the rods in place and for permitting their removal comprising a retaining member on one of the disks and movable thereon, said disk having notches receiving the ends of the rods, and means for normally holding the retaining member in rod retaining position, said means comprising a locking pin carried by the disk and engageable with the retaining member.

9. A surfacing unit comprising a drum having a pair of end flanges, rods extending between and at their ends supported by the said flanges, surfacing members on the rods, and means for holding the rods in place and for permitting their removal comprising a retaining ring seated in a groove of one of the flanges of the drum and movable on the flange.

10. A surfacing unit in the form of a drum, a pair of spaced flanges, rods extending between and at their ends supported by the flanges, surfacing members on the rods, one of the flanges being composed of a pair of disks secured together, and a rod retaining ring carried by said flange and having a portion thereof extending between the two disks.

11. A surfacing unit in the form of a drum comprising a sleeve, flanges at the ends of the sleeve and each composed of a pair of disks secured together, one disk of each pair having peripheral notches, rods extending between the flanges and at their ends seated in the notches, and a retaining ring having flanges covering the notches and the ends of the rods and having other flanges extending inwardly between the disks.

12. A unit in the form of a drum having a pair of end flanges, rods extending between and at their ends supported by the flanges, at least one of the flanges having peripheral notches in which the corresponding ends of the rods are seated, said flange having a retaining ring with a portion overlying the ends of the rods and the notches and provided with a notch or opening adapted to be moved by adjustment of the ring into and out of registration with the notches of the flange.

In testimony whereof, we hereunto affix our signatures.

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