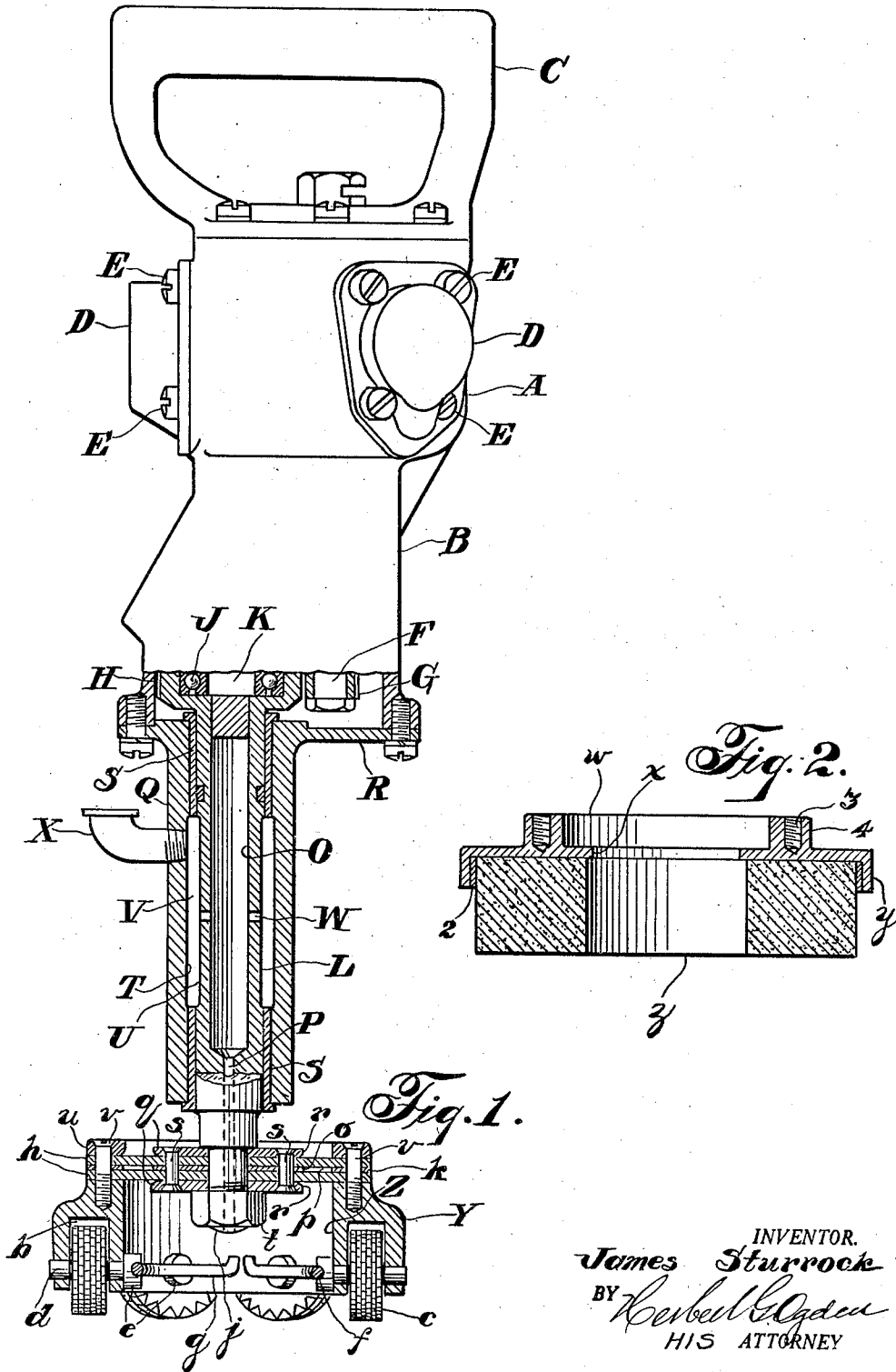


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J. STURROCK
SURFACING MACHINE
Filed Dec. 17, 1925



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SURFACING MACHINE.

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To all whom it may concern:

Be it known that I, JAMES STURROCK, a citizen of the United States, and a resident of Athens, county of Bradford, and State of Pennsylvania, have invented a certain Surfacing Machine, of which the following is a specification accompanied by drawings.

This invention relates to surfacing machines, but more particularly to pneumatically actuated rotating machines for surfacing concrete, slate, and other like materials.

The objects of the invention are to permit relative rocking movement between the driving spindle and the head which carries the abrading, and to supply a constant stream of water or other solvent through the head to the working face.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention consists of the combinations of elements, features of construction, and arrangement of parts having the general mode of operation substantially as hereinafter described and more particularly pointed out in the appended claims and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation partly in section of a pneumatic rotary tool, illustrating the manner in which water is supplied through the driving spindle of the machine to the working face and the manner in which relative rocking movement between the driving spindle and the abrading is obtained, and

Figure 2 is an elevation in section of a head adapted to be attached to the flexible connection shown in Figure 1 and illustrating the manner in which an abrading disk or grinding wheel may be secured thereto.

Referring to the drawings, the invention is shown embodied in a pneumatic tool indicated generally by A and having a cylinder B to one end of which is secured a handle C whereby the tool may be manipulated. The tool A is of the rotary type and accordingly has a plurality of pistons (not shown), but the position of two of which are indicated by the cylinder heads D which may be secured to the main cylinder B by means of screws E. A shaft F which may be connected to the pistons in any suitable manner to be rotated thereby extends

through the cylinder B to a point near the forward end thereof and carries at its front end a pinion G which may be formed separately and secured to the shaft as indicated in the drawings or may be formed integrally with said shaft.

Meshing with the pinion G is a gear H. The gear H is preferably provided with a frictionless bearing J which in this instance is arranged within said gear and cooperates with a stud K for centralizing the gear H. Formed integrally with the gear H is a driving spindle L having a bore O longitudinally through a portion thereof and a smaller passage P leading from the bore O to the outermost end of said spindle. A front head or casing Q encases the driving spindle L and is provided with a flange R at its rearward end which forms a closure for the front end of the cylinder B. The bore of the casing Q may be of somewhat larger diameter than the diameter of the spindle L to enable bushings S to be inserted in the ends of the casing to provide a renewable bearing surface for said spindles. The casing Q and the spindle L are in this instance provided with annular grooves T and U respectively which cooperate to form an annular chamber V between the ends of the bushings S.

Although the chamber V is shown in the drawings as being formed of cooperating annular grooves in the casing and in the spindle, a single annular groove of the desired area may, if desired, be formed in either the casing or the spindle. The chamber V in this instance communicates with the bore O of the spindle L through a plurality of ports W. Communication between said chamber and a source of supply of water under pressure is afforded by a connection X screwed in to the side of the casing Q.

Operatively connected to the free end of the spindle L is a head Y preferably of cylindrical form and having a central opening Z. An annular groove *b* is formed in the front face of the head Y for the reception of a plurality of burring wheels *c*. A convenient means for holding the burring wheels *c* rotatably in the groove *b* is shown

in the form of pins *d* which extend radially through the head and act as shafts for said wheels. At one end of the pins *d* are formed heads *e* whereby the pins *d* are limited against endwise movement in one direction. The heads *e* of the pins *d* in this instance are provided with semi-circular grooves *f* with which an expansible spring ring *g* may cooperate for holding the pins in operative position.

Means are provided for obtaining a relative rocking movement between the head *Y* and the spindle *L* and for preventing water ejected from the passage *P* from being deflected rearwardly toward the position of the operator. To this end a pair of flexible disks *h* are arranged on a reduced extension *j* of the spindle *L* and are held in spaced relation with respect to each other by an outer ring or washer *k* and an inner washer *o*. The outer diameter of the washer *o* is somewhat smaller than the inner diameter of the washer *k* so that a space *p* exists therebetween. The area of the space *p* determines the flexible area of the disks *h*.

Arranged on the outside of the disks *h* are suitable washers *q* substantially of the same diameter as the washer *o* and having rounded edges as at *r* to prevent chafing and cutting of the disks *h*. The washer *q*, the disks *h*, and the spacing washer *o* may be secured together in any suitable manner. A convenient method of accomplishing this is illustrated in the drawings, in which the parts are clamped together by means of rivets *s*. However, if desired, bolts or screws may be substituted for the rivets. The free end of the spindle *L* is screw threaded to receive a nut *t* whereby the disks and the washers may be securely clamped to the end of the spindle. The disks *h* may be of any suitable flexible material, such as rubber, or any equivalent compositions which possess the property of impermeability to water or other solvent which may be used for flushing the working face upon which the burring wheels are operating.

To the end that the disks *h* may be firmly secured to the head *Y* and that an effective seal may be maintained between the lowermost of said disks and the head, a ring *u* is arranged on the topmost disk *h* and is drawn down firmly to compress the edges of the disks *h* somewhat by means of screws *v* which engage the head *Y*.

Heretofore, there has no provision been made in machines of this type for supplying water to the working face, as a result the life of the abradant was of short duration and considerable discomfort was caused to the operator due to the presence of dust and the cuttings in the atmosphere. By means of this invention a continuous stream of water may be at all times supplied to the abradant. The objectionable features hereinbefore set

forth will be eliminated and a greater efficiency of the machine may be obtained. Owing to the manner in which the disks *h* seal the top portion of the head *Y*, any water or combination of water and cuttings which may be deflected from the working face will be prevented from splashing on the drill or on the operator, irrespective of the value of the pressure under which the water may be supplied.

Referring now to Figure 2, a head *w* is illustrated having a central opening *x* corresponding to the central opening *Z* in the head *Y*. The head *w* in this instance is provided with an annular flange *y* of suitable length to receive an abrading disk *z*. The internal diameter of the flange *y* is preferably somewhat larger than the external diameter of the disk *z* to permit a layer of liquefied sulphur 2 or other suitable substance to be introduced between said flange and the disks for the purpose of securing the disk *z* to the head *w*. Suitable tap holes 3 are formed in a boss 4 of the head *w* to receive the threaded ends of the screws *v* whereby the head *w* may be secured to the disks *h*.

I claim:

1. In a pneumatic tool, the combination of a rotatable spindle, a head adapted to carry an abrading device, and a flexible disk secured at its center to the spindle and at its edge to the head for rotating the head and for permitting relative rocking movement between the spindle and the head.

2. In a pneumatic tool, the combination of a rotatable spindle, disks having central openings to engage the spindle, a head adapted to carry an abrading device and secured to the disks, said disks being flexible to permit relative rocking movement between the spindle and the head, and means for reinforcing the central portion of the disks and for limiting the flexible area of said disks.

3. In a pneumatic tool, the combination of a rotatable spindle, a longitudinal bore through the spindle to receive water from a source of supply, disks forming a diaphragm and having central openings to engage the spindle, washers for reinforcing the central portion of the disks, a head adapted to carry an abrading device and secured to the outer edges of the disks, said disks being flexible to permit relative rocking movement of the spindle and the head, and a passage in the end of the spindle for delivering water from the bore to a working face.

4. In a pneumatic rotary tool, the combination of a rotatable spindle having a longitudinal bore, a casing for said spindle having a recess in communication with a source of water supply, ports in the spindle providing communication between the bore and the recess, a pair of flexible disks secured

directly to the end of the spindle, washers for holding the disks in spaced relation with respect to each other, washers for reenforcing the central portions of the disks and for
5 limiting the flexible area of the disks, a head adapted to carry an abrading device and secured to the disks whereby said head is permitted to rock with respect to the spindle, said head having a central opening, and a passage in the spindle for delivering water 10 through the head to a working face.

In testimony whereof I have signed this specification.

JAMES STURROCK.