Feb. 14, 1933. D. R. JOHNSTON 1,897,971

POLISHING TOOL

Filed March 10, 1930

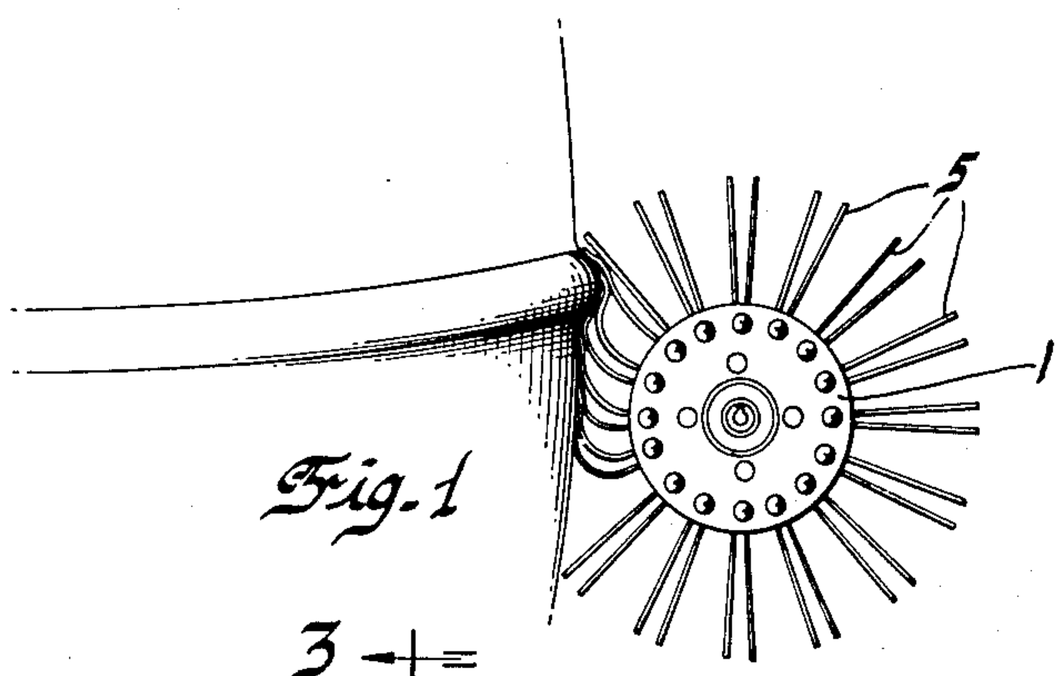

Fig. 1

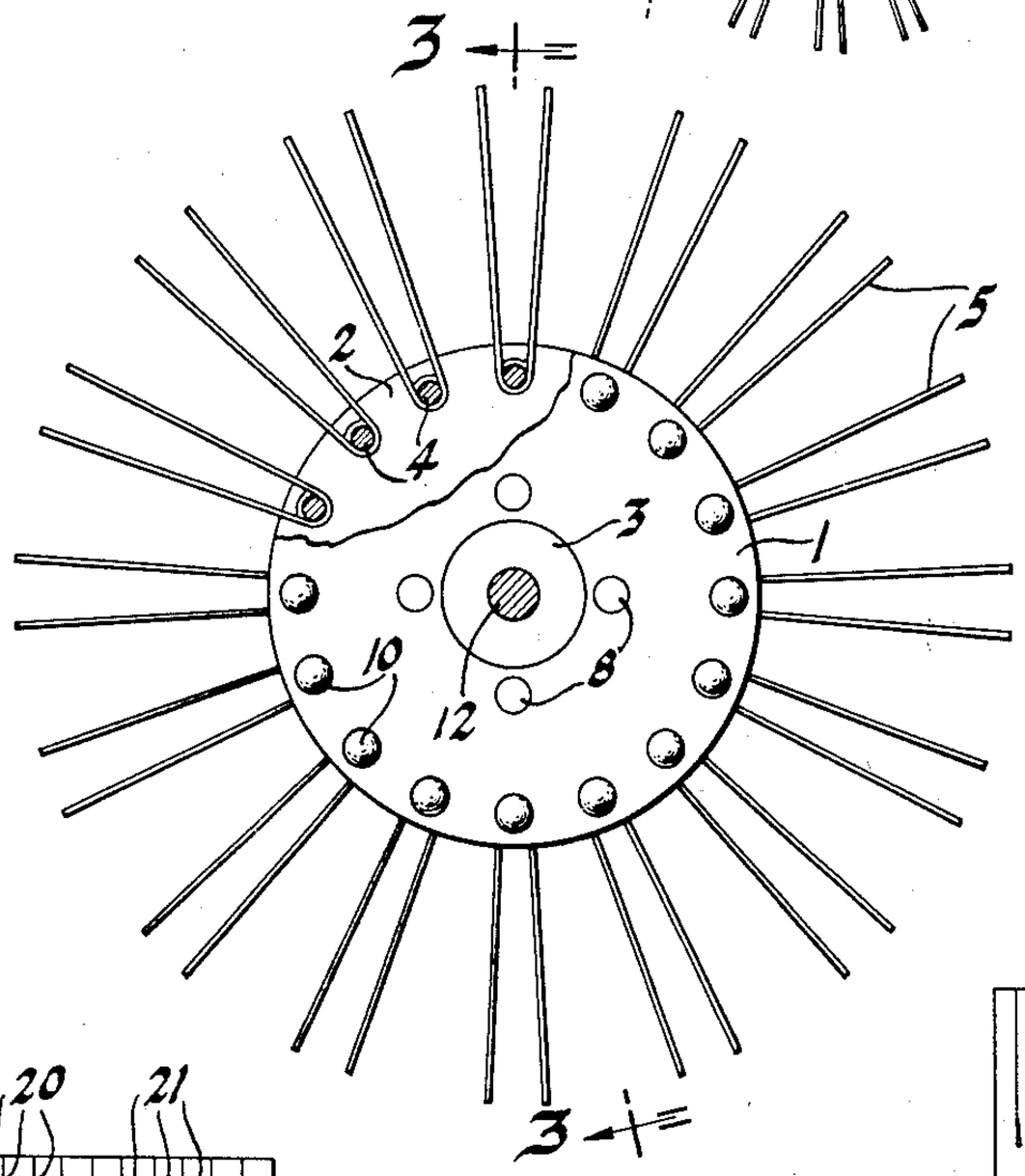

Fig. 2

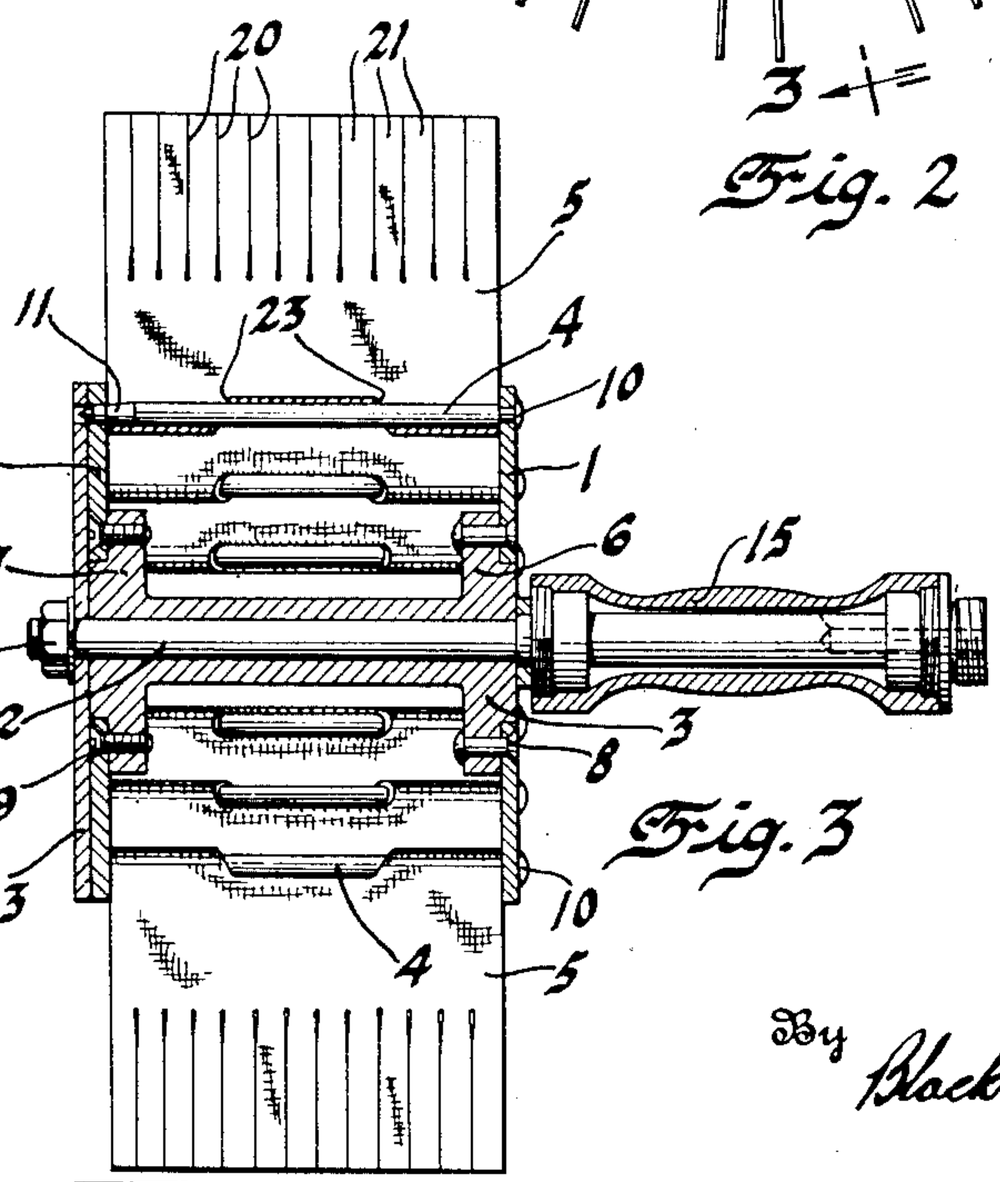

Fig. 3

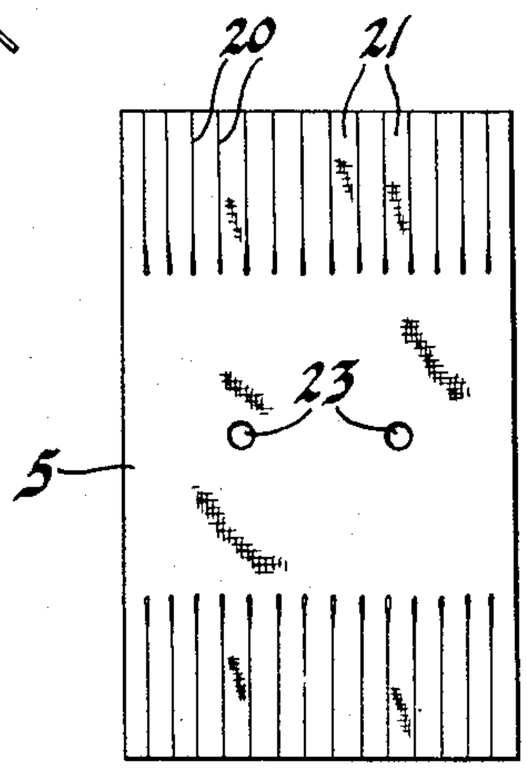

Fig. 4

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UNITED STATES PATENT OFFICE

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POLISHING TOOL

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This invention relates to power operated hand tools and particularly to a power driven device for finishing surfaces. Manufacturers of such products as automobile bodies have always clung to the practice of sanding and polishing their products by hand inasmuch as no mechanical substitute has been found as practical and efficient as hand work.

It is among the objects of the present invention to provide a power operated finishing device whose action will closely follow hand rubbing and polishing and which will produce results that reach and excel the perfection of hand work and turn out high quality work at a rapid speed and without the exercise of much skill and effort on the part of the workman.

It is a further object of the invention to provide a comparatively simple and cheaply manufactured device that may be easily and quickly assembled and disassembled to permit replacement of parts.

Another object is to provide a device that is usable with equal success on curved and sharply rounded or angled surfaces as on flat surfaces.

Other objects and features of advantage will become apparent during the course of the following specification having reference to the accompanying drawing wherein Figure 1 is an elevational view showing the tool in use.

Figure 2 is an enlarged elevational view of the tool with parts removed and other parts broken away to better illustrate the assembly.

Figure 3 is a sectional view and is taken on line 3—3 of Figure 2.

Figure 4 is a detail plan view of a replaceable finishing or work contacting part.

Referring to the preferred but not necessarily the only embodiment of the invention as illustrated in the drawing, the tool involves a drum-like carrier or frame that comprises in the main a pair of spaced circular plates or discs 1 and 2 mounted on a spacer hub 3 and carrying a series of circumferentially arranged pins or studs 4 adjacent the peripheries thereof on which are replaceably mounted a series of finishing flaps 5. As best shown in Figure 3, the spacer hub or sleeve 3 has its opposite ends provided with annular flanges 6 and 7 respectively, to the flange 6 of which the plate 1 is secured, as by means of rivets 8, the plate 2 being removably secured to the flange 7 as by screws or studs 9. The pins 4 are preferably carried between the two plates by having their ends adjacent the plate 1 extending through openings in the plate and being riveted or peened over as at 10 to afford a permanent connection, and their opposite ends tapered and reduced in diameter as at 11 and extending through and bearing in apertures or holes in the plate 2. Each pin may terminate in a point just beyond the reduced portion 11 to facilitate the mounting of a finishing flap as will be more fully referred to later.

The hub 3 is mounted on the drive shaft or axle 12, the assembly being secured to the axle by the washer or keeper plate 13 held in place by the nut 14 adjustably threaded on the shaft. This keeper plate is positioned beside the disc 2 and extends to the periphery thereof and is provided with a series of openings or holes for registration and alignment with the corresponding holes in the disc 2 for the partial projection therethrough of the pointed tips of the pins 4, affording in effect a protective enclosure or cover for the sharpened ends of the pins. The shaft 12 extends to one side of the flap carrier and has a bearing in the handle or grip sleeve 15 by means of which the tool is manipulated. Beyond the handle 15 the shaft is provided with some means by which it may be connected with a flexible power transmitting cable or the like that leads from a suitable source of power as for example an electric motor conveniently located in relation to the work.

The finish strip 5, shown in detail in Figure 4, has its opposite ends shredded or provided with a series of uniformly arranged slits 20 that afford a group of flexible tongues 21. The intermediate portion of the flap has two holes 23—23 formed therein. As before described it is to be noted that the parts are arranged so the flaps may be readily replaced from time to time as they wear out.

To mount a series of flaps on the carrier the parts are disassembled by removing the keeper plate 13 and the frame from the drive shaft and then uncovering the pins 4 by taking out the studs 9 and removing the plate 2. A flap 5 is then placed on each pin, the pointed pin being successively entered through the two holes 23 so that the flap portions between the margins of the sheet and the holes lie on one side of the pin and the portion between the holes lies on the opposite side of the pin. The flap is then folded or bent upon itself at the intermediate portion on the pin and extended outwardly tc afford a pair of work contacting parts as will clearly be apparent from the disclosure in Figure 2.

Where the surface of the work is to be cleaned preparatory to the application of a finishing coat of paint or the like, the flaps may comprise suitable abrasive sheets. If the surface coating has been applied and requires polishing, the flaps are then made from suitable polishing material, such as a vellous fabric or one having a short close nap of erect threads that afford a thick soft pile, velour being an example. It is found that the short hairs tend to quickly recover from deformation as they pass over the working surface which together with the fact that the flaps are moved into overlapping contact with each other when the tool is in use serves to keep the dirt agitated and in condition to be readily dusted or thrown off under the action of centrifugal force as the tool rotates. By reducing the likelihood of the flaps becoming caked with dirt their life or period of usefulness is materially increased.

When the tool is to be used, the operator, after connecting it with the source of power, brings the rotating carrier into proximity with the work, with its axis of rotation substantially parallel with the surface to be treated, until the ends of the flaps contact with the surface as illustrated in Figure 1. The working surface represented in Figure 1 consists of an automobile body panel having a moulding bead that provides a rounded surface and one which ordinarily would be very difficult to work. It will be obvious from this figure, that the several flaps are successively brought into contact with the surface and wipe over the surface one after the other in a manner that closely simulates rubbing and polishing by hand.

The flexible tongues 21 contact and move over every portion to be acted on and even in and around the sharp corners between the enlarged bead and the body panel. While the axis of the tool is shown in a horizontal plane in Figure 1, it will be readily understood that its axis may be in either a horizontal or a vertical plane so long as it is substantially parallel to the surface of the work. By positioning the tool so that its axis is 90° from that shown in Figure 1 for polishing the same moulding bead, or any similar or equivalent work, the surface of the bead and the adjacent corners can be readily reached by the shredded ends inasmuch as the several fingers 21 flex independently and relatively to each other and thereby accommodate the varying height of the bead.

I claim:

1. In a surface finishing tool, a rotary carrier, including a spacer hub, a plate secured to one side of the hub, a series of pins projecting laterally from said plate and being adapted to carry a series of finishing flaps and having tapered ends, a second plate detachably secured on the opposite side of the hub and having a series of locating apertures therein for the projection therethru of said pin ends, a drive shaft projecting thru said hub, and a keeper for securing the hub on the shaft and covering the points of the tapered ended pins.

2. In a surface finishing tool, a rotary disc having rigidly and permanently secured at the periphery a series of spaced pins projecting laterally from the inner face thereof, a series of finishing flaps, each having a pair of spaced openings therein through which one of said pins successively projects to constitute the sole means of carrying said finishing flap, and a second disc removably secured in spaced relation with the first disc and in contact with the free ends of the pins to detachably retain the finishing flaps on the pins and between the plates.

3. In a surface finishing tool, a pair of spaced rotary plates detachably secured together, a series of pins extending between the plates, and each having one end permanently and rigidly connected to one plate and its other end detachably associated with the other plate, and a series of replaceable sheets of finishing material, each having a pair of spaced openings adapted upon separation of the plates to successively receive the free end of a pin and being movable axially of the pin to engage or disengage the pin and openings.

In testimony whereof I affix my signature.

DAVID R. JOHNSTON.