Nov. 20, 1934. S. N. SELLS 1,981,076

PORTABLE MOTOR

Original Filed June 1, 1931 2 Sheets-Sheet 1

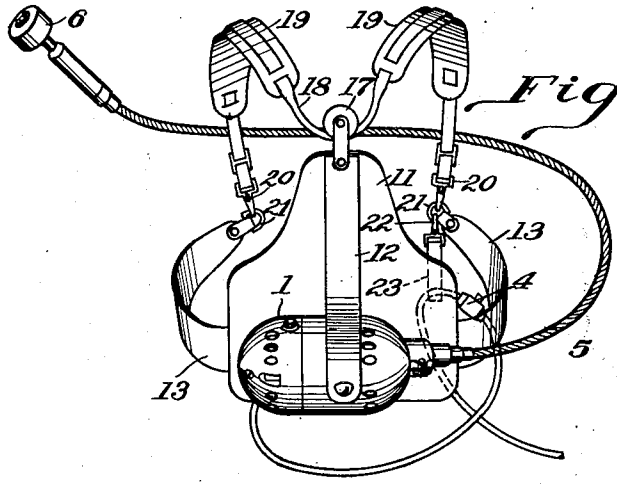
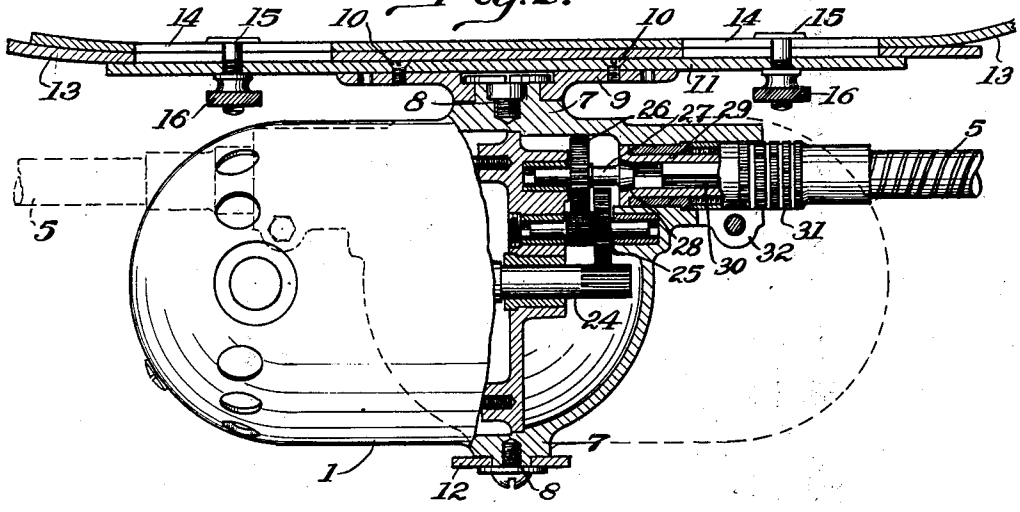


Fig. 1.

Fig. 2.



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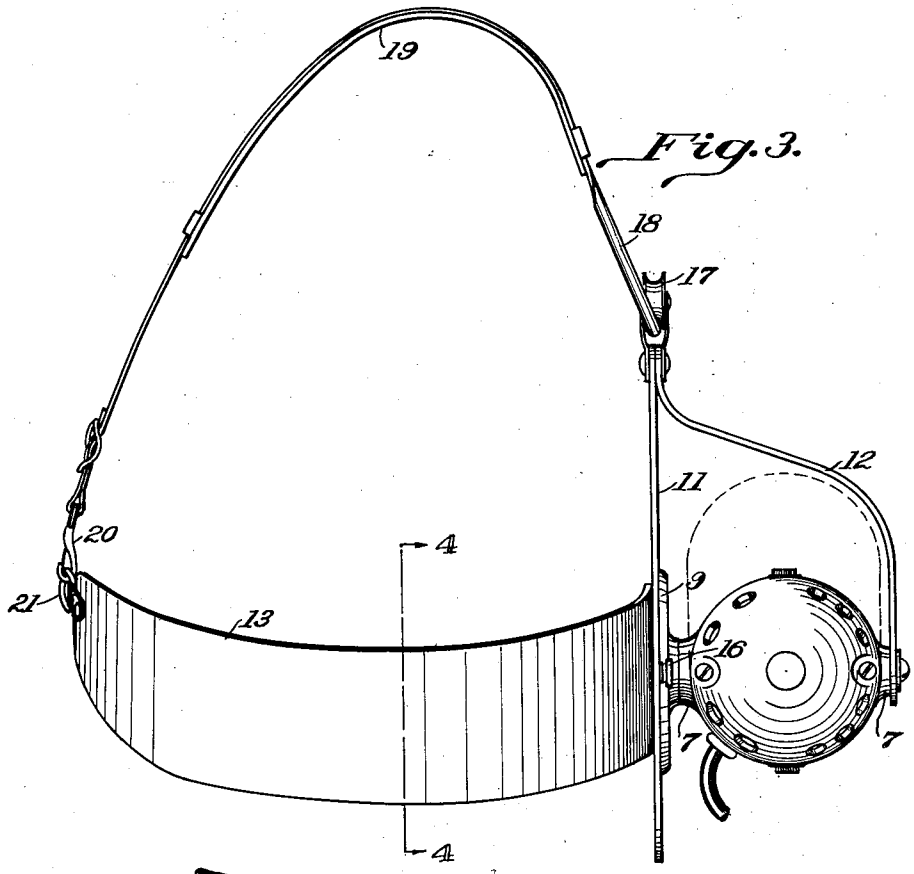


Fig. 3.

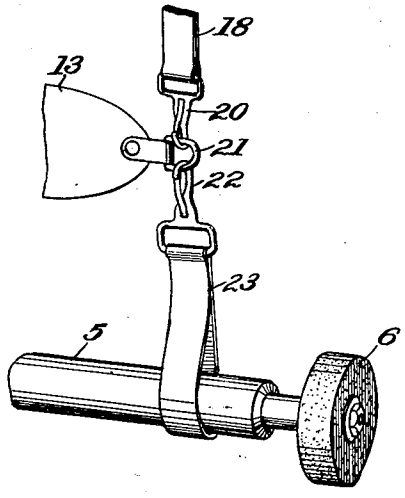


Fig. 5.

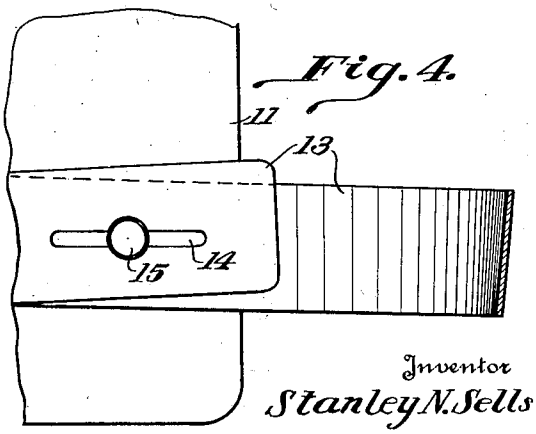


Fig. 4.

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UNITED STATES PATENT OFFICE

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PORTABLE MOTOR

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Application June 1, 1931, Serial No. 541,277
Renewed April 12, 1934

3 Claims. (Cl. 224—5)

This invention relates to improvements in shoulder suspended supporting means by which various articles or devices of varying weight may be applied to the back of the user and supported comfortably and conveniently in connection therewith. In a more specific aspect the present invention has for an object the provision of a supporting means for positioning an electric motor on the back of the wearer in order that said motor may be employed to effect the operation of a suitable appliance mounted on the outer end of an elongated flexible shaft driven by the motor.

It is another object of the invention to so mount the motor that it may be comfortably positioned on the back of the operator and so disposed that it will not in any way interfere with the free and unhampered movements of the wearer in the execution of various tasks to which a light motor driven tool or appliance may be adapted.

It is a further object of the invention to provide a supporting appliance of the character set forth wherein the motor is mounted on the support so that it may turn freely about a substantially horizontally disposed axis, whereby the flexible shaft connected with one end of the motor may be readily positioned on either side of the operator to permit it to be used to the best advantage in the performance of a given operation and at the same time to minimize wear and strain on the connections between the inner end of the flexible shaft and the motor shaft by permitting the motor to accommodate itself to pulls, strains and variations of position which are incident to the use of the flexible shaft.

Other objects of the invention reside in the provision of a shoulder engaging supporting harness which is of such form that it may be quickly applied to and adjusted on the back of the wearer without involving the use of uncomfortable belts, to form the harness so that it will readily respond to the movements of the wearer without creating discomfort, to provide means for effecting the support of the outer tool carrying end of the flexible shaft from the harness when said shaft is not in active use and to provide an easily worn, efficient, substantially constructed and durable portable motor means which may be usefully applied in the performance of many tasks to which a light motor driven tool may be adapted.

With these and additional objects in view, which will appear as the description proceeds, the invention consists in the novel features of construction, combination of elements and arrangements of parts hereafter fully described and pointed out in the appended claims.

In the accompanying drawings, forming a part of the specification and in which similar characters of reference denote like and corresponding parts throughout the several views thereof:

Figure 1 is a perspective view of the back carried motor support comprising the present invention,

Figure 2 is a horizontal sectional view taken through the mounting for pivotally securing an electric motor in connection with the support,

Figure 3 is a side elevation thereof,

Figure 4 is a vertical sectional view on the line 4—4 of Figure 3 taken through one of the waist clamps,

Figure 5 is a perspective view of the supporting loop for receiving the outer end of the flexible shaft when the latter is not in active use.

Referring more particularly to the drawings, the numeral 1 designates a relatively small light weight electric motor which is preferably formed to include an apertured housing formed from aluminum, or an alloy thereof, to minimize the weight of the motor. Current leads of suitable length extend from any suitable source of current supply to the lower portion of the housing, and an operating switch 4 may be carried by said leads or any other convenient point, to control the operation of the motor. The motor is of standard construction from an electrical standpoint and is, of course, adaptable to alternating and direct currents. The armature (not shown) of the motor may be connected either directly or through suitable speed reduction gearing with the inner end of the flexible shaft 5. This shaft is of considerable length so that it may be extended around the body of the wearer in order that its outer portion may be grasped by the hands and manipulated in a convenient manner. The extreme outer end of the shaft has connected therewith a removable appliance or tool 6, which may vary in shape and form, depending upon the particular work or operations to which it is adapted.

To effect the suspension or support of the motor on the back of the wearer, where the motor at all times will be readily available and yet out of the way and capable of being comfortably supported by the wearer, the housing of the motor is formed with a pair of horizontally aligned bosses 7 having threaded openings therein formed for the reception of trunnions 8. The inner of these trunnions is rotatably positioned in an opening provided in a supporting plate 9, which plate is fastened by means of screws or the like 10 to an enlarged back plate 11, which may be formed from fiber or other insulating material. Secured to the upper end of the plate 11 is an outwardly extending strap 12, which has its lower end formed for the reception of the outer of the trunnions 8. By this construction the motor is firmly secured to the plate but is free to swing or turn about the horizontal axis provided by the aligned trunnions 8 so that the motor may be turned either to the right or to the left to best adapt it to operating conditions.

To effect the support of the back plate 11 on the

back of the wearer, there is adjustably secured to the plate 11 a pair of resilient waist clamps 13. The inner ends of these clamps are slotted as at 14 for the reception of the shanks of headed screws 15. The threaded ends of the screws 15 pass through openings formed in the plate 11 and have their outer ends equipped with nuts 16 which may be used, when tightened, to frictionally retain the clamps in secured relationship with the back plate 11 and yet to permit the clamps to be adjusted so that they may be adapted to the waist dimensions of the wearer. The clamps 15 are stamped or molded so that they will conform to the curvature of the body of the wearer so that while they may press on and resiliently engage the waist it will not produce any appreciable discomfort. The outer ends of the clamps are spaced or separated and are devoid of straps or tightening buckles, which produce a very considerable degree of discomfort when worn for extended periods of time. Further, by spacing the ends of the clamps the harness structure may be very quickly applied to or removed from the wearer, since no adjustment of buckles is necessitated.

The upper end of the back plate 11 carries a pulley 17 around the lower portion of which passes the rounded intermediate part of a shoulder strap 18. This strap where it engages with the shoulders of the wearer is preferably provided with enlarged pads or shoulder members 19. The outer ends of said strap are provided with snap hooks 20 which are adapted to be received within eye members 21 secured to the outer ends of the waist clamps 13, whereby a fixed working relation is established between the shoulder strap, the waist clamps and the back plate. This relation is such as to permit the motor supporting means to respond freely and readily to the movements of the wearer without hampering or hindering the latter in the execution of various tasks and to permit the weight of the motor and associated parts to be directly suspended from the shoulders where such weight can be sustained for extended period of time without fatigue or discomfort.

As shown in Fig. 5 there may be connected with either of the eye members 21 by means of a snap hook 22, a loop 23. This loop may be employed for effecting the support of the outer end of the flexible shaft when the latter is not in active use. By the construction described it will be seen that the motor 1 is mounted so that it may readily turn on its supporting base, thus readily adapting the motor to changes in position of the flexible shaft 5 and to minimize pulls or strains on the connections between the inner end of the shaft 5 and the armature shaft of the motor, or again it may be desired to turn the motor completely through an arc of 180 degrees to permit the flexible shaft to be employed in either the right or left hand of the operator.

As shown in Fig. 2 the armature shaft 24 of the motor is provided with gear teeth at one end which mesh with an idler gear 25 loosely journaled for rotation within the motor housing. This idler has formed therewith a pinion which meshes with a gear 26 on a drive shaft 27. The drive shaft is formed with a conical over-load 28 which is frictionally received within a sleeve 29. This sleeve is provided with a polygonal bore adapted for the reception of the squared end 30 of the flexible shaft, and the shaft is formed, contiguous to the motor, with a ferrule 31, which is removably received within a split clamping socket 32 formed with the motor housing. It will be seen that the ferrule 31 and the flexible shaft may be readily removed from connection with the motor and in place thereof a drill or other form of tool may be substituted so that the motor may be employed for a wide variety of uses. In fact, by loosening the trunnions 8, which are in the form of removable screws, the entire motor may be disconnected from the supporting harness and used as a stationary motor by being bolted or otherwise secured to a supporting base.

The present invention, therefore, provides a convenient, easily worn, portable motor driven means for operating various tool appliances in a free, readily directed and unhindered manner. The device is particularly useful in the cleaning and repair of motor vehicles and in numerous other capacities where a light readily wielded motor driven appliance under manual control is required. While the invention has been described as particularly adapted for effecting the support of an electric motor, it is believed to be quite obvious that the harness structure may be likewise used in the support of other devices and I contemplate its use in all such capacities to which it may find application.

What is claimed is:

1. A shoulder harness comprising a back engaging plate, a shoulder strap having the intermediate portion thereof movably connected with the upper portion of said plate, resilient spaced waist engaging clamps connected with said plate and engaging the body of the wearer, and flexible connections between the outer ends of said strap and said waist clamps.

2. A shoulder harness for effecting the support of articles on the back of a wearer comprising a back plate, an anti-friction guide secured at the upper end of the back plate, a shoulder strap having its intermediate rear portion movably engaged with said guide, said strap being arranged to pass over both shoulders of the wearer and to terminate into forwardly disposed depending ends, fastening devices carried by the forward ends of said straps, resilient waist engaging clamps having their rear ends connected with said plate, said clamps being arranged to frictionally and resiliently engage the waist of the wearer, eye members connected with the spaced forward ends of said clamps and adapted for detachable connection with said strap fastening devices.

3. A shoulder harness for effecting the support of articles on the back of a wearer comprising a back plate, an anti-friction guide secured at the upper end of the back plate, a shoulder strap having its intermediate rear portion movably engaged with said guide, said strap being arranged to pass over both shoulders of the wearer and to terminate into forwardly disposed depending ends, fastening devices carried by the forward ends of said straps, resilient waist engaging clamps having their rear ends connected with said plate for longitudinal adjustment, said clamp being arranged to frictionally and resiliently engage the waist of the wearer, eye members connected with the spaced forward ends of said clamps and adapted for detachable connection with said strap fastening devices.

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