April 18, 1939. M. J. ROCHE 2,154,531

GRIPPING DEVICE

Filed Dec. 9, 1936

FIG. 1

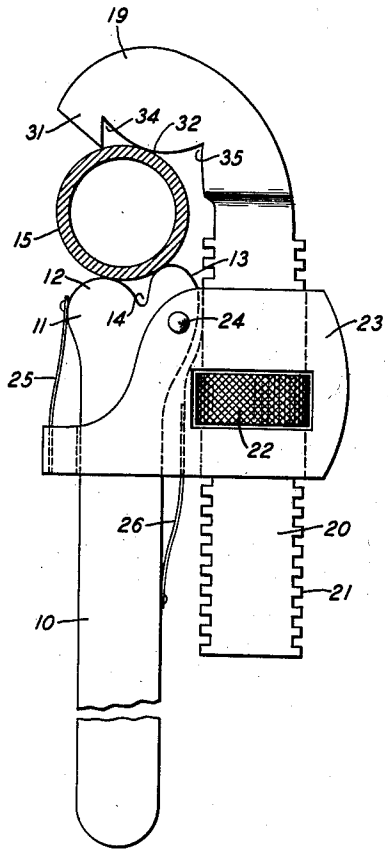


FIG. 2

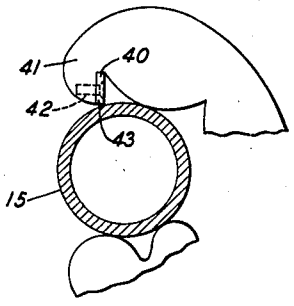
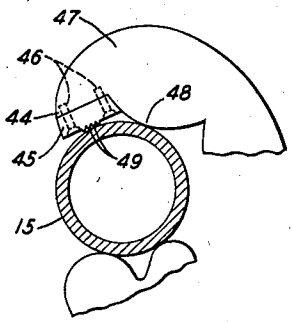


FIG. 3



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GRIPPING DEVICE

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1 Claim. (Cl. 81—186)

This invention relates to a gripping device, and more particularly to an improved wrench.

Heretofore, adjustable wrenches contemplated for the manipulation of tubular objects, or similar cylindrical work, have embodied a pair of parallel jaws affixed suitably to a handle. The opposing surfaces of the jaws were provided with a plurality of transverse teeth, or serrations, to bite into diametrically opposite portions of the periphery of the work when the jaws were clamped thereon. Depending on the magnitude of the force applied to the handle in driving the work, the teeth produce a plurality of impressions of varying depths in the periphery thereof. Obviously, these impressions, if sufficiently deep, affect deleteriously thin-walled tubes, and further are unsightly in cases where the work is to be exposed to permanent view.

It is an object of this invention to provide a wrench for driving cylindrical work without deleteriously affecting the circumferential surface thereof.

In the preferred embodiment, the invention comprises a pair of oppositely disposed clamping jaws, one of which is formed with two similar grips and the other with two dissimilar grips. These grips are designed so as to constitute a four-point engagement about work in a manner that one of the dissimilar grips bites into the periphery thereof.

The invention will be more readily understood from the following description when taken together with the accompanying drawing in which:

Fig. 1 illustrates the preferred form of the invention, and

Figs. 2 and 3 are modifications of Fig. 1.

Referring to Fig. 1, a handle 10 is formed on one end with a fixed jaw 11 whose gripping surface comprises a curvilinear portion 12 and a curvilinear portion 13 both of which project from the plane of the jaw 11 and are separated by a recess 14. The precise configurations of the curvilinear portions 12 and 13 depend on the diameter of work 15 with which the invention is contemplated for use. It is noted, however, that the curvilinear portion 13 is slightly longer than the curvilinear portion 12.

A movable jaw 19 disposed in opposing relation with respect to the jaw 11 is formed integral with a vertical extension 20 whose free end is provided with a plurality of screw threads 21. The latter are accommodated in similar threads formed on the inner periphery of a knurled collar 22. A yoke 23 carries the extension 20 and the knurled collar.

The yoke 23 is pivotally secured to the handle 10 at a point 24 adjacent to the jaw 11. By means of the knurled collar the jaw 19 is actuated to accommodate the work 15 between the jaws 11 and 19 in the well-known manner. Leaf springs 25 and 26 affixed suitably on opposite sides of the handle 10 serve to position the jaw 19 relative to the jaw 11.

The gripping surface of the movable jaw 19 comprises a pointed portion 31 and a curvilinear portion 32 both of which project from the plane of the jaw 19 and are separated by a recess 34. The pointed portion 31 may be formed by contiguous planes intersecting at a suitable angle. The curvilinear portion 32 is also separated from the main body of the jaw 19 by another recess 35. The precise configuration of the curvilinear portion 32 depends on the diameter of the work 15 with which the invention is contemplated for use. It is understood, of course, that the pointed portion 31 may be of any suitable configuration that will bite into work and, further, that it extends transversely of the plane of the jaw 19.

In Fig. 1, it will be observed that the curvilinear portions 12, 13 and 32 and the pointed portion 31 constitute a four-point engagement on the work. Moreover, of these four points, only the pointed portion 31 bites into the periphery of the work while the several curvilinear portions merely press thereon.

The wrench is applied to the work by manipulating the knurled collar 32 in the well-known manner. Under a force tending to move the handle 10 in a clockwise direction, the pointed portion 31 bites into the work to pull and the curvilinear portions 12 and 13 tend to push. It is understood, of course, that the curvilinear and pointed portions may be specially treated in the well-known manner for the purpose of rendering them serviceable for heavy duty.

Inasmuch as but one point of the four-point engagement bites into the work, the periphery will not contain the plurality of impressions that now result from the use of wrenches utilizing transverse serrations in their gripping surfaces. Consequently, work intended for permanent display will not be as unsightly as heretofore. In addition, the serviceable life of the wrench is considerably prolonged since the point 31 may be reshaped when necessary. This is an advantage when it is considered that worn and fractured serrations tend to limit the service of wrenches employing transverse serrations on their gripping surfaces. Moreover, since but one recess is formed in the periphery of the work during each

application of the wrench, thin-walled tubes are not deleteriously affected as in the case of wrenches employing a plurality of transverse serrations on each jaw face.

Fig. 2 illustrates a modification of Fig. 1 wherein the reshaping of the pointed portion 31 (Fig. 1) is obviated. In the modification, a rectangular strip 40 of suitable material is disposed transversely on the inner surface of a curvilinear portion 41, and removably secured thereto by a screw 42. When a lower edge 43 of the strip 40 no longer bites into the work the strip 40 may be inverted and transposed until the four edges of the strip 40 become worn. As the strip becomes unsuitable for further use, it may be replaced.

Fig. 3 is a modification in which a member 45 is removably secured by screws 46, 46 to a curvilinear portion 44 of an adjustable jaw 47 and is disposed adjacent to a curvilinear portion 48. The member 45 is provided on one surface with one or more transverse serrations 49, 49 that bite into the periphery of work as the jaws are clamped thereon as shown in Fig. 1. The member may be suitably treated for the purpose of rendering it serviceable for heavy duty. The advantage of this modification lies in the removability of the member 45 which may be replaced as the serrations 49 become worn and fractured. If desired, the member 45 may be formed integral with the jaw 47. It is understood, of course, that the serrations 49 may be of any suitable configuration that bite into the periphery of the work.

While the invention is disclosed with particular reference to smooth surfaces on the curvilinear portions, it is not necessarily confined thereto. In cases where the work 15 is to be concealed, the curvilinear portions may be formed with one or more transverse serrations. In such events, it will be understood that the utility of the device is in nowise impaired when the serrations become worn and broken off since, as it has been shown hereinbefore, the invention possesses a general utility when the curvilinear portions are formed with smooth surfaces.

Furthermore, it will be understood that the invention is readily suitable to hold cylindrical objects in a stationary position, such for example, as in the case of an electrical ground clamp, a bench vise, or similar fixed clamping devices. Likwise it is evident that the invention is contemplated for use in actuating or holding objects having configurations other than cylindrical.

It will be further understood that the invention is capable of other modifications by those skilled in the art, and is to be limited only by the scope of the appended claim.

What is claimed is:

A Stillson type of wrench comprising a handle having a fixed inner jaw, a movable outer jaw, the fixed jaw being formed with an outer curvilinear grip and an inner curvilinear grip both of which project from the plane thereof with such lengths as to engage work in different planes which are transverse to the longitudinal axis of the handle, the movable jaw being provided with an outer pointed grip and an inner curvilinear grip both of which project from the plane thereof with such lengths as to engage work substantially in the same plane which is transverse to the longitudinal axis of the handle, the normal spacing between the outer grips being greater than that between the inner grips, the grips on the two jaws comprising a four-point engagement on substantially opposite segments of work such that the pointed grip bites thereinto, and means for effecting the four-point engagement in such manner that a point of engagement of the pointed grip and a point of engagement of the outer grip on the fixed jaw are disposed in a plane which is substantially parallel to the longitudinal axis of the handle while a point of engagement of the inner grip on the movable jaw and a point of engagement of the inner grip on the fixed jaw are disposed in a different plane which is substantially parallel to the longitudinal axis of the handle.

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