Feb. 18, 1936. W. F. ERRIG ET AL 2,031,472

HAND TIRE GROOVER

Filed Feb. 28, 1935

Fig. 1.

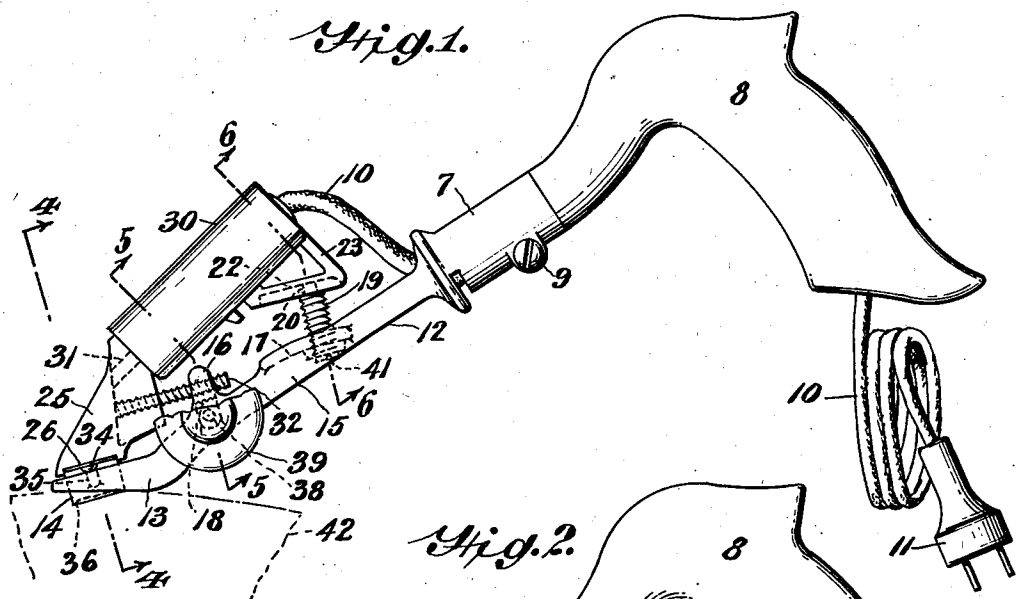


Fig. 2.

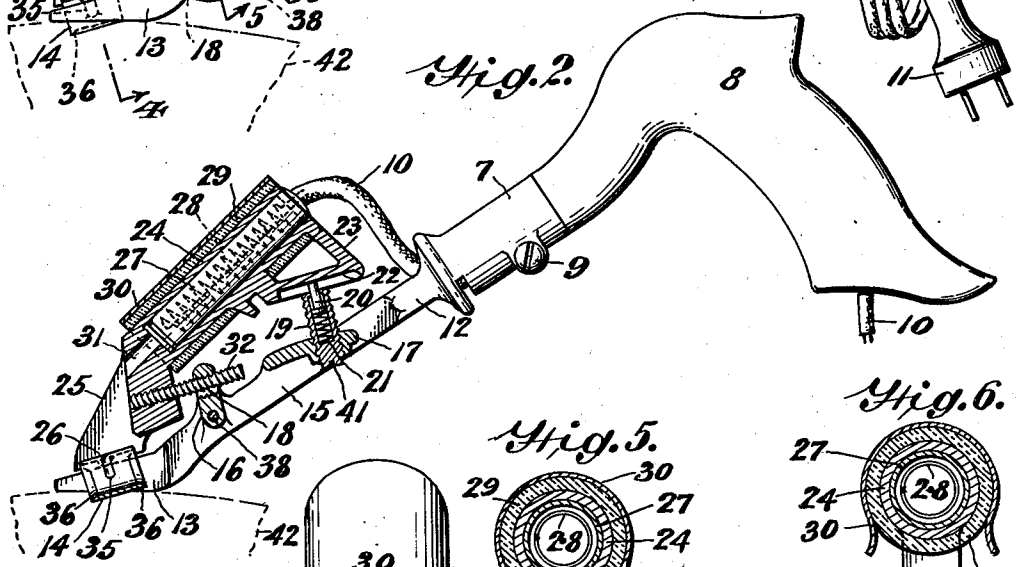


Fig. 4.

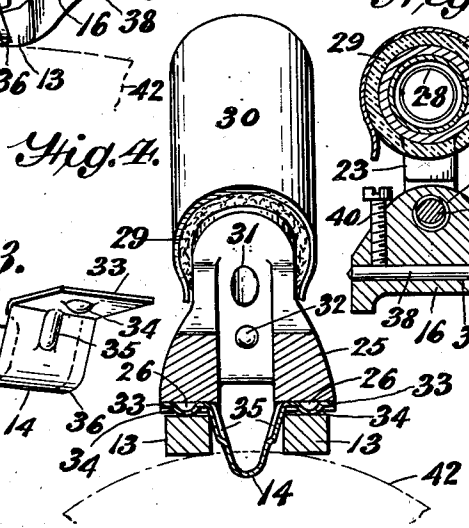


Fig. 3.

Fig. 5.

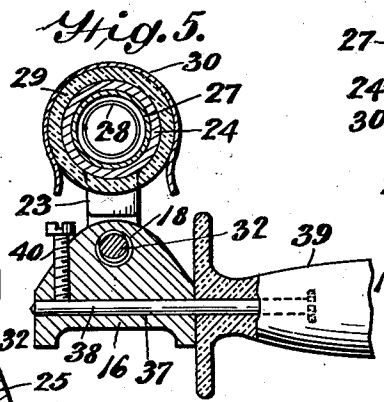
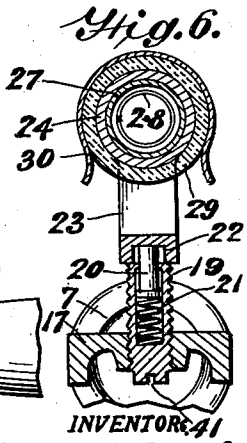


Fig. 6.



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HAND TIRE-GROOVER

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Application February 28, 1935, Serial No. 8,708

12 Claims. (Cl. 30—20)

This invention generally relates to tire-grooving devices by means of which both circumferential, cross and otherwise directed grooves may be rapidly re-cut in the tread of a tire, or by the use of which previously formed grooves that have become reduced and by wearing down of the tire tread may be readily restored to their normal effective condition.

More specifically this invention has reference to the type of hand operated tire-groover including means for heating the grooving element or blade whereby the grooving operation is more rapidly effected.

The general object of this invention is to provide an improved form of hand tire-groover in which the heating unit is arranged so that the body of the tool is maintained comparatively cool, with incidental increase of efficiency and a material reduction in operating expense.

Another object is to provide a hand tire-groover in which the cutting element is so formed and supported relative to the holder shoe that a minimum of heat conduction to said shoe results with consequent increase in the general efficiency of the groover.

A further object is the provision of a tire-groover of the indicated type equipped with a double-edged cutting element which can be easily adjusted for cutting grooves of different depths either while hot or previous to using the tool.

A still further object is the provision of a tire-groover of the kind referred to which is fitted with a handle that lends itself to ease in operation of the groover, said groover being also equipped with an auxiliary handle adapted for right-or-left hand placement relative to the tire-groover whereby guidance of the groove-cutting operation is greatly facilitated.

Other objects and advantages of this invention will be pointed out in the detailed description thereof which follows, or will become apparent from such description.

In order that the invention may be readily understood and its practical advantages fully appreciated, reference may be had to the accompanying sheet of drawing, in which is depicted one form of embodiment thereof. However, it is to be understood that changes in the details of construction may be made within the scope of the following claims without departing from the fundamentals of the invention.

In the drawing:—

Fig. 1 is a side elevation of one form of the improved hand tire-groover in accordance with this invention.

Fig. 2 is a similar elevation with the left-hand portion mainly in longitudinal section for better illustration of otherwise hidden structural features.

Fig. 3 is a perspective view of the grooving element or cutter, hereinafter fully explained.

Fig. 4 is a cross-section on the plane designated 4—4 in Fig. 1.

Fig. 5 is a similar cross-section on the staggered plane designated 5—5 in Fig. 1; and,

Fig. 6 is a like cross-section on the staggered plane designated 6—6 in Fig. 1.

Like characters of reference indicate corresponding parts in all the figures, while the viewing of the cross-section is in the direction of the associated arrows of the plane markings in Fig. 1.

In accordance with the particular embodiment of the invention illustrated the improved tire-groover comprises a main or manipulating member having a socket 7 in which the heat insulating handle 8 is securely clamped by a set-screw 9, in an obvious manner. The handle 8 and socket 7 are suitably apertured for passage therethrough of a flexible conductor, such as an electric cable 10 having at its outer end a conventional plug-in device 11.

Co-extensive with the socket portion 7 is a shank 12 terminating in spaced holder portions jointly forming the groover shoe sections 13, between which is located and sustained the grooving blade 14, hereinafter fully explained. The shank 12, it is to be noted, preferably embodies longitudinally-spaced integral portions 15 that terminate in the shoe sections 13, said portions 15 being united by bridge braces 16, 17, the former of which 16 has an aperture 18 therethrough for a purpose later on set forth. Threadedly passing through the brace 17 is a tubular stud 19 fitted with an upwardly-acting plunger pin 20 under the influence of a spring 21, that coacts with a groove 22 in the underside of a bracket portion 23 of the heater holder 24 to lock the latter stationary as well as restrained from lateral movement. This heater holder 24, it will be seen, is angularly-related with respect to the shank 12 and in the nature of a tubular device, having the bracket portion 23 integral therewith, as well as a forwardly-directed forked foot-piece 25 with the undersides transversely grooved at 26. The heater 27 is of conventional character and includes a coil 28 connected to the flexible conductor 10; while the holder 24 is surrounded by a suitable heat insulating packing 29 clamped

thereabout by a spring shield 30; and 31 is an axial orifice through the lower or forward end of the holder to enable easy ejection of the heater unit when spent or defective.

Threadedly engaged in the holder forked foot-piece is a stud 32 which passes freely through the correspondingly-threaded or fluted-aperture 18 in the shank bridge brace 16, and it will be readily seen, more particularly by reference to Figs. 2 and 5 that by coaction of the stud 32, or circumferentially-grooved shank thereof, with the threaded or fluted aperture 18 of the bridge piece 16 that the heater holder foot piece 25 can be variably arrested and positionally held, longitudinally, relative to the groover shoe 13, as later on more fully explained. The bridge brace 16 constitutes a fulcrum for the stud 32 about which the heater holder is adapted to be rocked during adjustment of the foot piece 25.

Referring again to the tire cutting element or grooving blade 14 it will be best appreciated, from Figs. 3 and 4, the same is of somewhat U-shaped cross-section with lateral flanking flanges 33, of a dimension to snugly fit the foot-piece transverse grooves 26. These flanges 33 are formed with downward embossments or teats 34 for point contact with the confronting upper faces of the groove shank shoe portions 13; while the side walls of the grooving blade 14 may have opposing outwardly-projecting ridges 35 for similar coaction with the inner upper edges of said shoe portions 13. Furthermore, the grooving blade 14 has both of its curved ends beveled to provide double cutting-edges 36 whereby it can be readily reversed should one edge become dulled or otherwise defective; and it is preferably made from tightly tempered strip metal, thereby ensuring long and accurate service.

Conveniently, although not essentially, through the bridge brace 16, below the aperture 18 therein, is a transverse bore 37 for insertion of a rod 38 having a heat-insulating finger grasp 39, and it will be readily understood from Fig. 5, said rod 38 may be inserted from either side of the bridge piece 16, and that it can be clamped in place by the set screw 40, in an obvious manner; said finger grasp facilitating guidance of the tire grooving device during operation and more particularly when cutting cross or inclined grooves.

In use it will be readily understood that by retracting the tubular stud 19 from the illustrated position of Figs. 1, 2, as by a screw driver applied to the cross-cut 41, the heater holder 24 will be released, whereupon the forked foot 25 can be moved longitudinally of the groover shank 12 to give the grooving blade 14 the desired projection below the shoe 13, whereupon by tightening-up or a reverse turning of the stud 19, said foot 25 and blade 14 will be locked against relative movement with respect to the shoe 13 through coaction of the screw 32 with the fluted aperture 18 of the cross brace 16, as hereinbefore described. It will also be understood that the blade 14 is readily insertable in, or removable from the foot piece transverse grooves 26, and that it is securely clamped in place at the desired adjustment when the screw stud 20 is tightened up as aforesaid. Furthermore, by virtue of the point contacts of the teats 34 and ridges 35 with the forked shoe sections 13 little, or a negligible heat conduction is transmitted to said shoe sections; or in other words substantially all of the heat from the heater 27 is conducted direct to the blade 14 where it is needed and with no discomfort to the operator. Cutting of circumferential, cross, or otherwise directed grooves in the tire 42, indicated in dotted lines in Figs. 1, 2, will be so self-evident to those conversant with the art that a detailed explanation herein is deemed unnecessary; while it will be obvious that the device 11 may be plugged into any convenient socket connecting with a source of electric current.

From the foregoing description of this invention, it should be evident that various changes and modifications from the illustrated disclosure may be made without departing from the spirit or scope of said invention as defined by the following claims.

Having thus described our invention, we claim:

1. In a tire-groover the combination of a manipulating member with a handle at one end and a shoe section at the other, said shoe section having its upper surface rearwardly inclined, a spacedly-related heater holder having a forwardly-directed foot piece for coaction with the shoe section inclined surface, a grooving blade engaging the holder foot piece, means whereby the grooving blade is clamped between the foot piece and shoe section so as to project below the latter, and the grooving blade having portions adapted to be slidably adjusted on the shoe section inclined surface to produce various depths of its projection below said section.

2. The combination of claim 1 wherein the shoe section and foot piece embody spacedly-confronting forks, and said foot piece has a transverse groove in its underside for seating retention of the grooving blade.

3. In a tire groover the combination of a manipulating member with a handle at one end and a forked shoe section at the other, said shoe section having its top surface upwardly and rearwardly inclined, a heater holder supported over the manipulating member and embodying a forwardly-directed foot piece adapted for slidable movement lengthwise of the shoe section inclined surface, a grooving blade seated in a transverse groove in the underside of the heater holder foot piece, means whereby the heater holder and grooving blade can be moved and the latter set at various depths of projection below the manipulator shoe section, and upwardly acting means carried by the manipulating member and engaging the heater holder to arrest the grooving blade at the requisite adjustment.

4. In a tire groover the combination of a manipulating member with a handle at one end and a forked shoe section at the other, said shoe section having an upper surface inclined upwardly and rearwardly, an angularly-related heater holder having a forwardly-directed foot-piece adapted for slidable adjustment along the shoe section inclined surface, a grooving blade having portions seated in a groove transversely in the underside of the holder foot piece, said blade portions being adapted to be slidably adjusted along the shoe section inclined surface to produce various depths of its projection below said section, means for variably setting the heater holder and foot piece relative to the manipulating member, and means for securely holding the parts aforesaid so adjusted.

5. In a hand tire groover the combination of a manipulating member with a handle at one end and a forked shoe section at the other, said shoe section having its upper forked surfaces upwardly and rearwardly inclined, an angularly-related heater holder having a forwardly-directed foot-piece, a grooving blade having portions seated in a groove transversely in the underside of the

holder foot piece, means for variably adjusting said holder along the inclined surfaces to produce various depths of its projection below said shoe section, spring-influenced means for holding the parts aforesaid in adjusted relation, and an auxiliary finger grasp carried by the manipulating member for facilitating guidance of the groover during operation.

6. The combination of claim 5 wherein the grooving blade is of somewhat U-shaped cross-section, the said seated portions constituting flanges adapted to snugly fit the transverse groove in the underside of the heater-holder foot piece, said blade having both of its curved ends beveled to provide reversible cutting edges, and "teats" formed in the flanges to afford point contact with the manipulating member shoe.

7. The combination of claim 5 wherein the grooving blade is of somewhat U-shaped cross-section, the said seated portions constituting flanges adapted to snugly fit the transverse groove in the underside of the heater-holder foot piece, said blade having both of its curved ends beveled to provide reversible cutting edges, and the flanges have "teats" and the side walls of the blade have outwardly directed "ridges" to respectively provide point contacts for engaging the manipulating member inclined surfaces and their confronting inner upper edges.

8. The combination of claim 5 wherein the means for variably adjusting and holding the heater holder relative to the manipulating member comprises an apertured bridge piece integral with said member, said aperture being internally grooved, a correspondingly-grooved stud projecting rearwardly from the heater holder foot piece to engage the aperture, and a threaded tubular adjusting stud enclosing said spring influenced holding means.

9. The combination of claim 5 wherein the means for holding the manipulating member and heater holder relatively adjusted comprises a tubular screw stud supported by the manipulating member, and said stud includes a spring-influenced plunger-pin for coaction with a grooved projection below the heater holder.

10. The combination of claim 5 wherein the finger grasp for facilitating guidance of the tire groover in use consists of a rod for engagement in a transverse bore through the manipulating member shank from either side thereof, said rod having a heat insulated finger grasp at one end, and means whereby said rod is normally held against rotation.

11. In a tire groover the combination with a manipulating member including a shoe section having an upwardly and rearwardly inclined surface, a heater holder supported on the member and having a foot piece adapted for slidable adjustment along the inclined surface aforesaid, a grooving blade having portions inter-engaged with the foot piece, and means for clamping the blade portions between the foot piece and shoe section whereby, as the foot piece is adjusted on the inclined surface of the shoe section, the blade will produce various depths of cutter projection below said shoe section.

12. In a tire groover the combination with a manipulating member having a shoe section having upwardly and rearwardly inclined surfaces, of a foot piece slidable thereon, a grooving blade between the foot piece and shoe section and interlocked with said foot piece, a heater holder connected with the foot piece, and means for adjusting the heater holder and thus the foot piece longitudinally on the inclined surfaces of the shoe section and manipulating member, thereby to variably regulate the depth of the groove cut in the tire.

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