Nov. 29, 1949 G. A. CLAYTOR 2,489,399

SURFACE-TREATING MACHINE

Filed Aug. 5, 1947 2 Sheets-Sheet 1

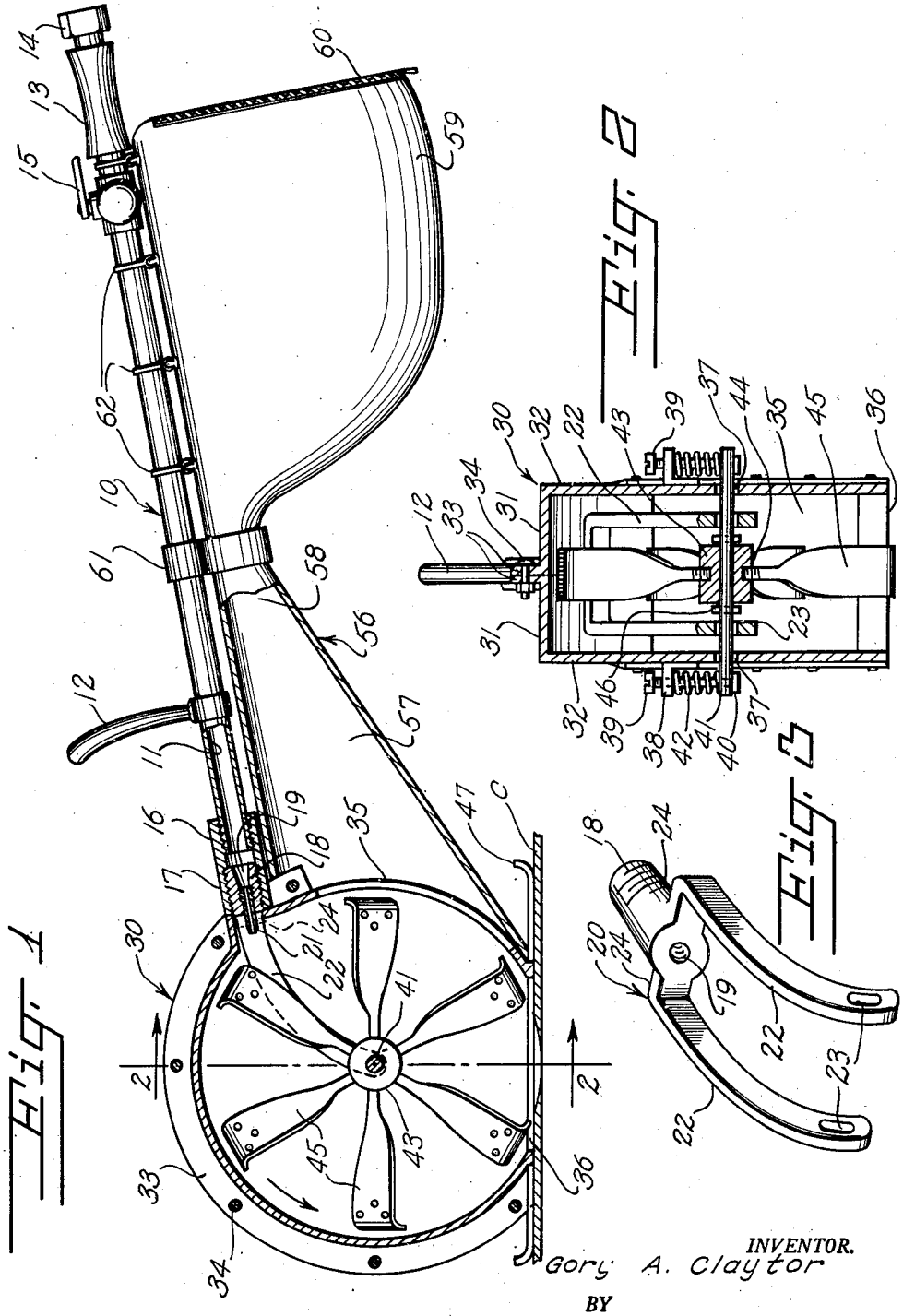


Fig. 1

Fig. 2

Fig. 3

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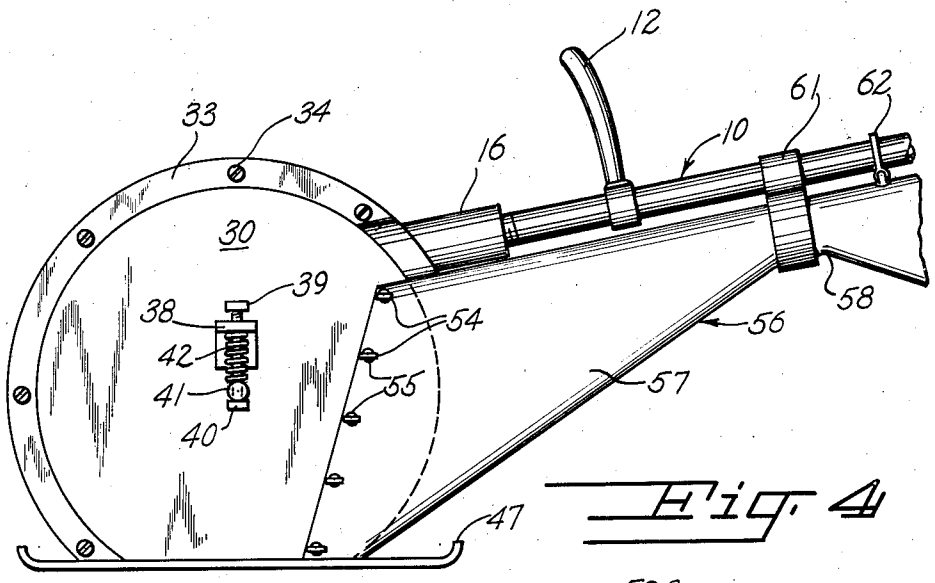


Fig. 4

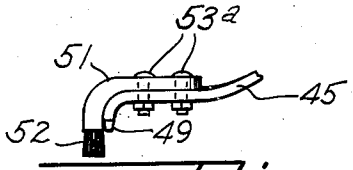


Fig. 7

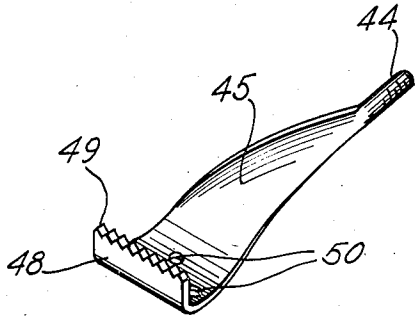


Fig. 5

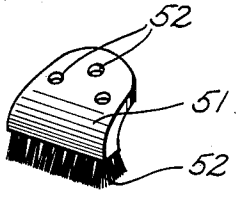


Fig. 8

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SURFACE-TREATING MACHINE

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2 Claims. (Cl. 15—93)

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My invention relates to surface-treating machines, and more particularly to rotary abrading machines, wherein the machine is passed over the surface to remove a surface covering therefrom, such as wallpaper, paint, varnish, cr the like, without damage to the under surface.

With the foregoing in view, an object of my invention is to provide an improved surface-treating machine.

A further object is to provide an improved surface-treating machine which includes a rotor having radial blades for shredding a surface covering, and wherein the rotor is adjustable toward and away from the surface in accordance with the thickness of the covering to be removed.

A further object is to provide a machine of the class described, wherein the blades for treating the surface also comprise impeller blades and are driven by a jet of fluid under pressure.

A further object is to provide a surface-treating machine of this class, wherein the draft created by the rotor blades is utilized to dispose of the portions of the surface covering which have been removed.

Other objects and advantages reside in the particular structure of the invention, combination and arrangement of the several parts thereof, and/or in the particular method or mode of operation, all of which will be readily apparent to those skilled in the art upon reference to the drawings in connection with the following specification, wherein the invention is shown, described and claimed.

In the drawings:

Figure 1 is an elevation of a preferred form of the invention, with portions thereof cut away and shown in longitudinal vertical section;

Figure 2 is a transverse vertical section taken substantially on the plane of the line 2—2 of Figure 1;

Figure 3 is a perspective view of a detail of the invention apart from the rest of the machine;

Figure 4 is an elevation of a portion of the machine;

Figure 5 is a perspective view of one of the rotor blades apart from the rest of the machine;

Figure 6 is a perspective view of an attachment for one of the rotor blades apart from the blade;

Figure 7 is a fragmentary elevation of the attachment of Figure 6, shown applied to a rotor blade.

Referring specifically to the drawings, 10 designates a handle member of elongated form and

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provided with an axial conduit 11 for the passage therethrough of fluid under pressure. A substantially radially-extending hand grip 12 of any suitable form is attached in any suitable manner to a forward end of the handle 10. A second hand grip 13 is provided on the handle 10 adjacent the rear end thereof. The rear end of the handle 10 is provided with any suitable means 14 for connecting the conduit 11 of the handle to a suitable source of fluid under pressure (not shown). A control valve 15 is mounted on the handle 10 adjacent the rear hand grip 13. The forward end of the handle 10 is exteriorly threaded and has threaded thereon a suitable sleeve member 16, which sleeve is interiorly threaded, as at 17, at the forward end thereof, and threadedly receives the threaded stud 18 of a yoke member 20. The stud 18 is axially bored, as at 19, and the forward end of the bore 19 is interiorly threaded to receive the threaded inner end of a jet nozzle 21. The yoke 20 is provided with a pair of yoke arms which arise at the forward end of the stud 19 in substantially radial directions to provide shoulder portions 24 extending at substantially right angles to the axis of the stud 19. Outwardly of the shoulder portions 24, the yoke arms are extended forwardly and downwardly, as indicated at 22, and are provided, adjacent the free ends thereof, with arcuate slots 23 which extend transversely therethrough in axial alignment with each other.

A housing 30 is fixed on the forward end of the handle 10 and held against the forward edge 17 of the sleeve 16 by being gripped between such forward edge and the shoulders 24 of the yoke member. The housing 30 is generally cylindrical in form and may be formed of two cup-shaped halves each comprising a substantially cylindrical wall 31 and an opposed end wall 32. The free edges of the side wall 31 may be formed with radially outwardly-directed abutting flanges 33 which are adapted to be secured together by any suitable fastening means 34 to form the housing. The side walls 31 below the handle 10 are cut away to provide the arcuate opening 35 therethrough and the lower portions of the walls 31 are cut away also to provide the arcuate opening 35. The ends walls 32 are provided with elongated slots 37 axially thereof and in substantial axial alignment with the arcuate slots 23 of the yoke arm 22. The outer periphery of each end wall 32 above the slot 37 is formed to provide an axially-directed ear 38. Each ear 38 is formed with a downwardly-directed and interiorly-threaded opening to receive the threaded shank of a bolt

member 39. Each bolt 39 is detachably secured to a shaft 41 by being extended therethrough and secured thereto by any suitable means, such as the nuts 40. A coil spring 42 surrounds the bolt 39 intermediate the ear 38 and the shaft 41, whereby to exert a yielding pressure on the shaft. The shaft 41 is loosely received in the slots 37 of the housing, and also in the slots 23 of the yoke. Inwardly of the housing and between the yoke arms 22 the shaft 41 rotatably mounts the hub 43 of the rotor. Suitable pins 56 exteriorly of the hub 43 and extending through the shaft 41 retain the rotor on the shaft and prevent axial movement of the rotor. At the same time, the rotor is permitted free rotation on the shaft. The periphery of the rotor 43 is formed to provide a plurality of threaded and radially-extended openings which receive the threaded end shanks 44 of the impeller element 45.

Each impeller blade 45 has an end portion 48 adjacent the tip which is bent at substantially right angles to the body of the blade and the free edge thereof is serrated, as at 49, to provide an abrasive tip for each blade. Each blade 45 is formed adjacent the portion 48 with a plurality of perforations 50. In Figures 6 and 7 there is disclosed an accessory element 51 which comprises a shank portion adapted to fit over the free end of the impeller 45 and which shank is provided with a plurality of holes 53 adapted to register with the perforations 50 of the impeller blades 45. The free end of the accessory 51 may be formed to provide wire bristles 52 for a purpose to be described later. Any suitable fastening means 53a is adapted to be extended through the registering openings 50 and 53 to secure the accessory 51 on the tips of the impeller blades 45.

The outer periphery of each housing element is formed in the region adjacent the rear opening 35 with any suitable fastening elements 54 which are adapted to be passed through a plurality of edge openings 55 in a receptacle 56. The receptacle 56 is formed of cloth or other suitable material and is provided with a funnel-shaped free end 57 which surrounds the opening 35 to receive scraps of surface material discharged thereinto by the impeller blades 45. The funnel-shaped portion 57 terminates in a throat 58 of restricted character which in turn opens into an enlarged storage portion 59 of any suitable form. The storage compartment 59 is closed by any suitable fastening means, such as the hookless fastener 60, Figure 1. The throat portion 58 of the bag 56 is detachably connected to the handle by any suitable strap member 61 and/or by suitable detachable fasteners 62.

Referring particularly to Figures 2 and 4, it is noted that by suitably adjusting the screws 39 in the ears 38, the shaft 41 may be raised or lowered in the slots 37 and 23 of the casing and yoke, respectively. As is clearly shown in Figure 1, the free ends or tips of the blades 45 are adapted to extend through the bottom opening 36 of the housing for an abrading contact with a surface covering which has been diagrammatically indicated by C in Figure 1. If it is desirable, the housing may be provided with any suitable runners 47 to permit a smooth and even contact with the surface covering C.

In operation of the device, the rotor and blades 43 and 45, respectively, together with the axle 41, are adjusted toward or away from the surface covering C until it has been determined

that the rotor tips will extend through the opening 36 only a distance sufficient to cut through the surface covering C without damaging the under surface of the wall or the like. This can very readily be determined by trial and error, or by actual measurements. When this has been determined, the valve 15 is turned on, whereby a jet of fluid under pressure issues from the nozzle 21, impinges on the blades 45 of the rotor, and causes rapid rotation thereof. The runners 47 may then be pressed against the surface and the apparatus moved over the surface by means of the hand grips 12 and 13. The draft created by the rotor blades 45 drives the shredded covering material up the funnel portion 57, through the throat 58, and into the storage compartment 59 of the receptacle 56. It will be noted from Figure 1 that the impeller blades 45 are positioned at about an angle of 45° to the axis of the jet issuing from the nozzle 21. This arrangement not only provides an efficient impeller structure, but also causes the serrated teeth 49 of the blade tips to engage the surface covering C with a shredding action which is diagonal to the forward motion of the machine as a whole, whereby an efficient removal of the covering C is achieved. After the machine has been passed over the entire surface, it may be dismounted and the brush accessory 51 may be applied to the blade tips. As the bristles 52 extend below the serrated tips 49 of the blades 45, it will be necessary to again adjust the axle 41 away from the surface to provide proper contact. Thereafter, the machine can be again passed over the surface and the bristles 52 of the brush will provide an efficient finishing step whereby to remove any remaining small portions of the covering C and to condition the surface of the under surface for the application of an additional covering.

Any suitable fluid under pressure may be utilized to operate the impellers 45. Moreover, if desired, a suitable electric motor may be mounted for driving the impeller blades.

While I have shown and described what is now thought to be the preferred embodiment of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure shown and described hereinbefore, except as hereinafter claimed.

I claim:

1. A machine for removing a surface covering from a sub-surface, comprising a tubular handle providing a conduit for fluid under pressure, a rotor assembly including a shaft, a rotor journaled thereon, a bifurcated yoke providing legs mounting said shaft and straddling said rotor, said yoke having a bight portion connecting said legs and providing shoulders substantially at right angles to said legs, an axially-bored stud formed on said bight portion and extending outwardly thereof, a jet nozzle in communication with the bore of said stud and extending inwardly of said bight between said legs, radially-disposed impeller blades on said rotor in operative relation to said nozzle, a housing surrounding said yoke, rotor and blades, said housing having an opening formed therein for the passage of said stud therethrough, and means detachably connecting said stud to one end of said handle with the bore of said stud in communication with said conduit of said handle, an abutment on said end of said handle, said shoulders on said yoke being adapted to clamp said housing against

said abutment to secure said yoke, handle and housing together, at least a second opening in said housing, the tips of said blades being adapted to extend through said second opening during rotation for an abrading contact with said surface covering, and means for supplying fluid under pressure to said nozzle for rotation of said blades and rotor.

2. A machine for removing a surface covering from a sub-surface, comprising a handle, a rotor assembly including a shaft and a rotor journaled thereon, a bifurcated yoke providing legs mounting said shaft and straddling said rotor, said yoke having a bight portion connecting said legs and providing shoulders substantially at right angles to said legs, an axially-bored stud formed on said bight portion and extending outwardly thereof, a jet nozzle in communication with the bore of said stud and extending inwardly of said bight between said legs, radially-disposed impeller blades on said rotor in operative relation to said nozzle, a housing surrounding said yoke, rotor and blades, said housing

having an opening formed therein for the passage of said stud therethrough, means detachably connecting said stud to one end of said handle, an abutment on said end of said handle, said shoulders on said yoke being adapted to clamp said housing against said abutment to secure said yoke, handle and housing together, at least a second opening in said housing, the tips of said blades being adapted to extend through said second opening during rotation for an abrading contact with said surface covering, and means for supplying fluid under pressure to said nozzle for rotation of said rotor.

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