

June 23, 1953

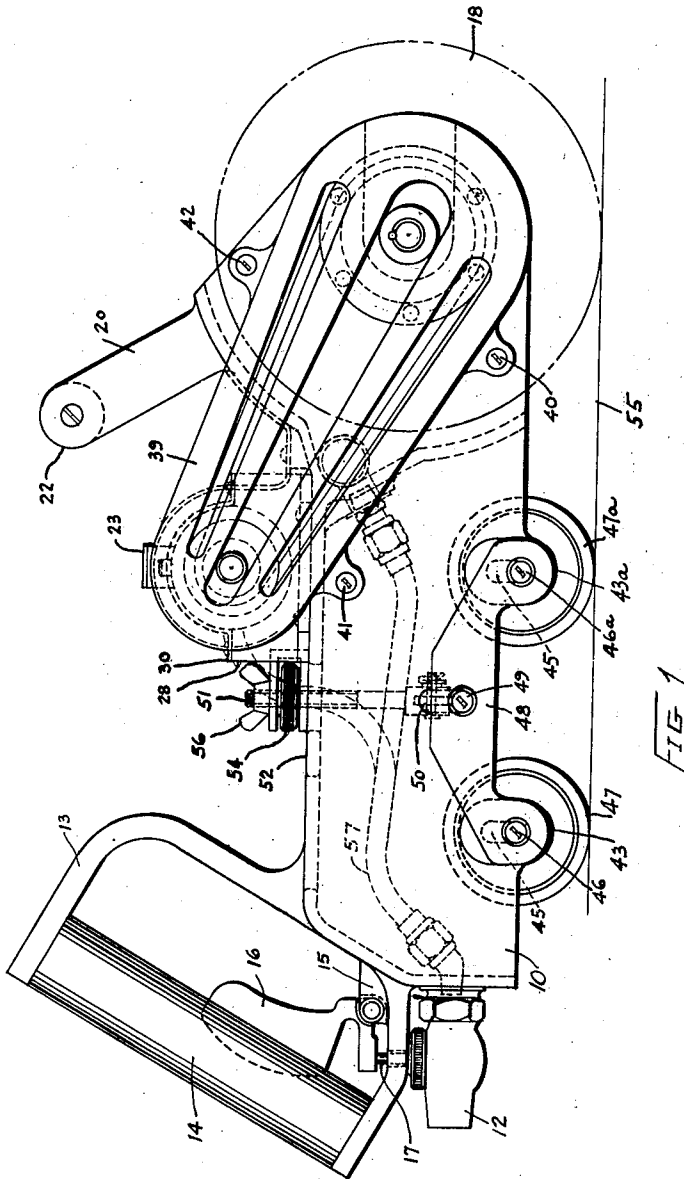
G. HABIAN

2,642,599

AIRPLANE CLEANING AND POLISHING MACHINE

Filed Aug. 13, 1949

3 Sheets-Sheet 1



INVENTOR.
GEORGE HABIAN

BY

BY
Vanderwerker & Shively

ATTORNEYS

June 23, 1953

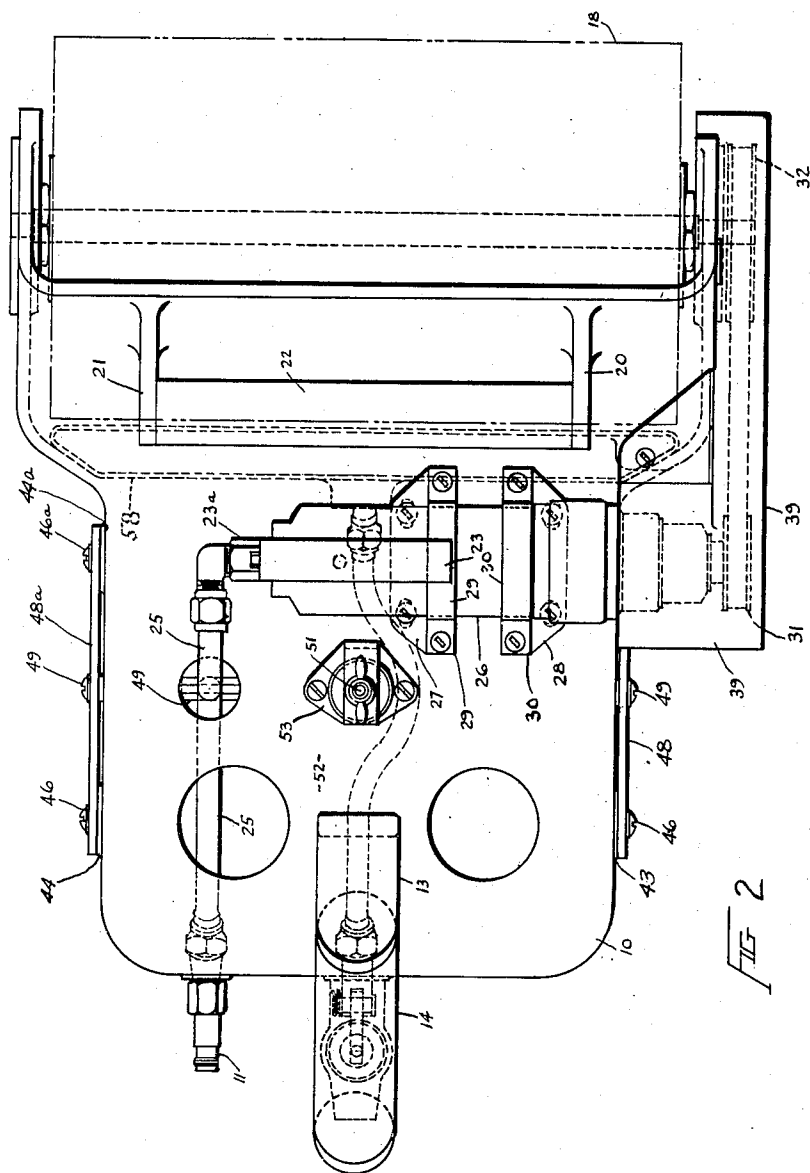
G. HABIAN

2,642,599

AIRPLANE CLEANING AND POLISHING MACHINE

Filed Aug. 13, 1949

3 Sheets-Sheet 2



INVENTOR.
GEORGE HABIAN

BY.

Vanderenter & Shively

ATTORNEYS

June 23, 1953

G. HABIAN

2,642,599

AIRPLANE CLEANING AND POLISHING MACHINE

Filed Aug. 13, 1949

3 Sheets-Sheet 3

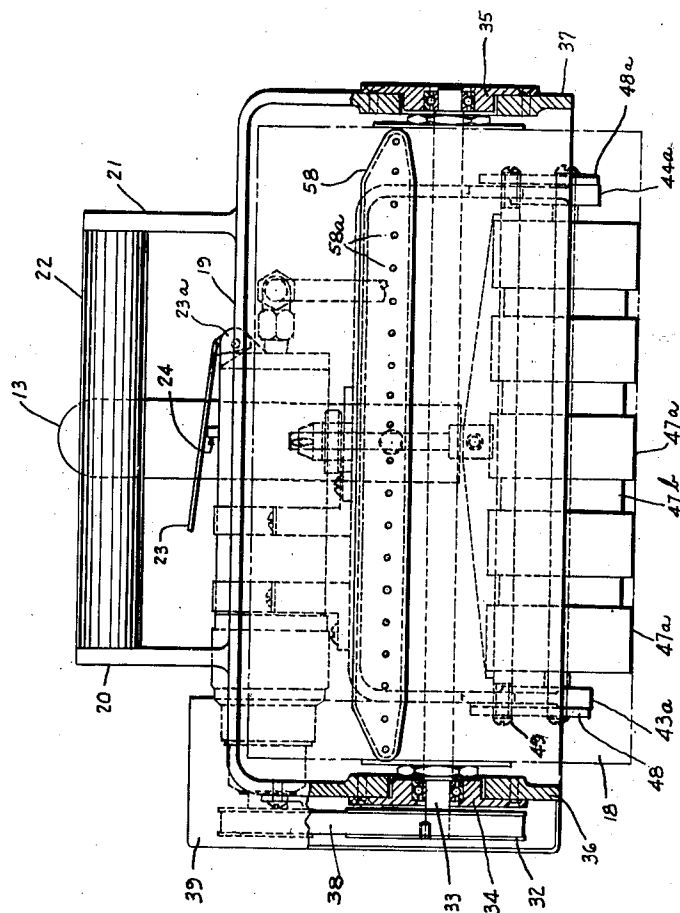


FIG 3

INVENTOR.
GEORGE HABIAN

BY
Van Deverter & Shively
ATTORNEYS

UNITED STATES PATENT OFFICE

2,642,599

AIRPLANE CLEANING AND POLISHING
MACHINE

George Habian, Manhasset, N. Y.

Application August 13, 1949, Serial No. 110,081

7 Claims. (Cl. 15—24)

1

This invention relates to an aircraft cleaning and polishing machine specifically designed for cleaning and polishing the exterior metal surfaces of aircraft, although the machine is applicable to cleaning automobiles and other structures where such machines are commonly used.

Objects of the invention are to provide a device of the character described, the use of which—as more fully set forth herein—will improve the appearance of the surface to which the device is applied, expedite the cleaning and polishing thereof, and reduce the man-hours of labor and cost thereof as compared with known devices.

Other objects and advantages will be apparent from the following specification, and drawings wherein by way of illustration is shown a preferred embodiment of the invention particularly well suited for use in cleaning and polishing the exterior of aircraft. It will be understood, however, that this disclosure is merely illustrative and is not limitative, as many changes in the details of the device can be made without departing from the invention as defined by the appended claims.

In the accompanying drawings:

Fig. 1 is a side elevational view of the device embodying the invention.

Fig. 2 is a plan view of the device Fig. 1 looking down on the top of same.

Fig. 3 is an end view of the device shown in the preceding figures.

Referring to Fig. 1, the numeral 10 denotes a metal frame forming a casing or housing in or upon which is supported all parts of the device so that same forms a unit structure complete with handles, control valves, rotating brush or buffer and the necessary means for adjusting the brush or buffer to the work. This structure also carries the air-hose connection 11 for the driving motor and the connection 12 for liquid supply to the brush.

Formed integrally with frame 10 or secured thereto in any suitable manner is a yoke or handle support 13 carrying between its arms the handle 14 secured thereto, in any suitable manner.

Mounted in the ears 15 projecting from the frame is a movable trigger 16 which may be easily operated by the fingers of the user's hand embracing handle 14. This trigger controls a valve 17 in the liquid supply pipe 12 to admit liquid to the brush or buffer 18 when desired.

The frame 10 is flared outwardly at its front end and to form a forwardly and upwardly

2

extending portion 19 partially surrounding the brush or buffer 18 and forming part of or secured to said portion 19 are the arms 20, 21 supporting a handle 22. The frame is widened out to receive the brush as best seen in Fig. 2.

Located below handle 22 so as to be within reach of the fingers of the hand embracing handle 22 is a trigger 23 controlling the air valve 24 located in the supply pipe 25 extending from the air hose connection 11 to the driving motor 26, and located within the motor casing. This trigger is supported in ears 23a projecting from frame 10, the flange of pipe 25 or the motor 26. The cylindrical motor 26 is mounted in any suitable manner and may be supported on pillow blocks 27, 28 secured to or forming part of the frame 10. The motor is held in said blocks by caps 29, 30, and by loosening the caps, the motor may be adjusted transverse the frame 10 to properly position the driving pulley 31 thereof in respect to the driven pulley 32 secured to shaft 33 of the brush; this also permits the motor to be readily removed for examination and repair.

The shaft 33 is mounted in suitable bearings 34, 35 supported in the downwardly extending side walls 36, 37 of frame 10.

A belt 38 extends between the pulleys 31, 32 and an auxiliary removable casing or cover 39 is secured to the frame 10 in any suitable manner as by screws 40, 41, 42 permits the easy inspection and replacement of the belt.

Extending from the frame 10 are the elongated bosses 43, 43a, 44, 44a—one pair on each side of the device. These bosses each have an elongated aperture such as 45 (Fig. 1) to receive the shafts 46, 46a of two sets of the adjusting rollers 47, 47a which may have rubber faces, said rollers being located between the yokes 48, 48a, to which the ends of said shafts are secured. The shafts may turn in the yokes to permit the rollers to revolve freely, or the rollers may be secured to the shafts and the latter turn in bearings in the yoke. If desired the rollers 47a for example, may comprise a core 47b (Fig. 3) and the roller proper is formed of a plurality of rubber sections of larger diameter than the core.

If preferred each roller may be made up of a plurality of individual rubber-tired rollers, in which event the core 47b becomes a plurality of spacers between the rollers.

Extending between the yokes is a bar 49 which extends through slots 50, in the side walls 43, 44 of the bosses.

A vertical shaft 51 is secured to the bar 49 and has an upper threaded end which extends through an opening in the upper wall 52 of the frame 10 and is held in upright position by the boss 53.

A nut 54 engages the upper threaded end of the shaft 51 and by turning this nut, the entire assembly comprising the two sets of rollers 47, 47a and the yokes 48, 48a constituting the means for adjusting the application of brush 18 to the work surface 55 such as the exterior surface of an airplane, can be adjusted.

The nut 56 is provided for locking the assembly just described, in adjusted position, and the ease of this necessary adjustment is one of the objects of this invention.

Communicating with the liquid supply valve 17 is a pipe shown in dotted lines at 57 (Fig. 1) to conduct liquid to the sprayhead 58 overlying to the surface of brush 18. This sprayhead has a line of perforations of the usual character at 58a, as commonly employed in such devices and the liquid under pressure in 58 is discharged onto the brush 18 and applied to the work surface 55 thereby.

By the provision of handles 14 and 22 at right angles to each other and at opposite ends of the device, handling of same is greatly facilitated, the rollers 47, 47a supporting the weight of the machine on the work surface 55. By slightly rocking or tipping the device toward the brush end, using rollers 47a as a fulcrum, the pressure applied by brush 18 to the work can be varied within limits determined by the setting of rollers 47, 47a, thus allowing the operator some latitude in applying the device to the work independently of the setting of rollers 47, 47a. However, said rollers define and limit the normal operation of the device, as they determine the maximum pressure than can be applied to the work when the device is evenly pressed thereagainst. This feature of the operator having a limited control of the brush is another object attained by this invention.

By "brush" in this specification is meant any rotatable member of bristles, felt, rubber or other cleaning, polishing or abrasive material; for brevity the term "brush" in the appended claims is used to describe any rotating element at 18.

It will be noted that brush 18 projects freely in front of frame 10. This enables the brush to be used in round corners where wings join bodies, etc., in airplanes. The handle 22 is also set back of the brush so that when the latter is run up to a vertical wall, the user's hand on this handle will not strike the wall.

Cleaning operation

With the proper brush installed in the machine, liquid polish, which is supplied from a remote source, is forced under pressure through the valve 17 mounted beneath the handle 16. Upon releasing the flow of polish through the operation of the trigger 16 the liquid polish through pipe 57 flows to the sprayhead 58 where it is ejected through orifices in the sprayhead 58 and is deposited on the rotating brush 18 which is powered by the air motor 26. The brush 18 applies the liquid polish to the surface of the metal which is to be cleaned.

The amount of liquid polish is governed by its release or stoppage through the action of the trigger 16.

The air motor 26 is powered by compressed air, the source of which is remote. This compressed

air, fed through a hose, passes through a quick connecting plug 11. The air then passes through an interconnecting tube to a valve 24 which is controlled by a lever 23 through the action of the thumb at the forward handle 22 of the machine.

Polishing operation

When a metal surface has been cleaned, it requires the removal of the dried polish. For this operation the cleaning brush 18 is removed, and in its place the proper brush for polishing is installed. The hose, which connects to the valve 17 is removed, since it is not required for the polishing operation. The hose supplying the compressed air remains attached to the quick disconnect plug 11. The operation of the machine is identical to that used in the cleaning operation, only that liquid polish is not used. The machine merely goes over those areas that contain dried polish and removes the same and polishes the surfaces.

Brush adjustment

Surface contact of the brush to the metal surface is controlled through the manipulation of the adjusting nuts 54 and 56 and the vertical shaft 51. These parts raise or lower the said shaft which carries the yokes 48, 48a which in turn are connected to the rubber cushioned rollers 47, 47a that contact the surface 55 and govern the amount of brush deflection to the metal surface. This adjustment also compensates for brush wear.

While an air motor has been shown at 26 it is obvious that any other form of motor may be used. If an electric motor is used, the connection 11 becomes a plug, and the valve 24 a switch both connected to the motor in the usual manner. All such modifications are obvious and deemed to be within the scope of the appended claims.

What is claimed is:

1. In a device of the character described, a frame, a brush rotatably supported in the front part of said frame and extending partially below the bottom edge thereof to engage a work surface, driving means including a motor carried by said frame for rotating said brush, a pair of shafts extending across said frame and positioned therein rearwardly of said brush, rollers carried by said shafts and adapted to engage a work surface, means mounted on said frame above said shafts for simultaneously adjusting said shafts and the rollers thereon whereby the application of said brush to the work surface may be adjusted, a handle secured to said device, means for applying liquid to said brush including a liquid supply pipe positioned to supply liquid to said brush in a direction perpendicular to the axis thereof to wet said brush before it contacts the work surface, and a valve in said pipe located adjacent said handle for operation by the user's hand thereon without releasing said handle and while said device is in operation.

2. In a device of the character described, a frame, a brush rotatably supported in the front end of said frame and extending partially below the bottom edges thereof to engage a work surface, driving means including a motor carried by said frame for rotating said brush, a pair of shafts extending across said frame and positioned thereon rearwardly of said brush, rollers carried by said shafts and adapted to engage a work surface, and means mounted on said frame above said shafts for simultaneously adjusting

5

both said shafts and the rollers thereon whereby the application of said brush to the work-surface may be adjusted, a handle secured to said frame, control means for said motor located adjacent said handle for operation by the user's hand thereon without releasing said handle and while said device is in operation, means including a liquid supply pipe in said frame for supplying liquid to said brush, a second handle secured to said frame and a valve in said pipe located adjacent said last handle for operation by the user's hand thereon without releasing said handle and while said device is in operation.

3. In a device of the character described, a frame, a rotatable brush in said frame adapted to contact a work-surface below said frame, a pair of shafts extending across said frame and positioned thereon rearwardly of said brush, rollers carried by said shafts and adapted to engage a work surface, and means mounted on said frame above said shafts for simultaneously adjusting both said shafts and the rollers thereon whereby the application of said brush to the work surface may be adjusted, a handle secured to said frame and having its axis lying in a plane at an angle to said surface and projecting to the rear of said frame, a second handle secured to said frame and spaced apart from said first handle and having its axis parallel to the plane of said surface, a motor for rotating said brush carried by said frame, a pipe having a valve therein for supplying liquid to said brush, and control means adjacent said first handle for controlling said valve.

4. In a device of the class described, a substantially U-shaped frame having an outwardly flared front end having side walls, a rotary brush mounted in said flared end, and having bearings in said side walls thereof, a sprayhead located within said frame and overlying the surface of said brush and adapted to discharge liquid on said brush in a direction perpendicular to the axis thereof whereby said brush is wet by said liquid before contact with the work surface, a motor having a shaft parallel to the axis of said brush supported on said frame at the rear of said brush, a belt connecting said shaft and brush, an auxiliary casing secured to said frame and enclosing said belt, means for controlling said motor and means for controlling the flow of liquid to said sprayhead both said means being mounted on said frame, and handles on said frame adjacent both said means whereby either of said means can be operated independently of the other and without the user removing his hands from the handles.

5. In a device of the class described, a substantially U-shaped frame having a pair of elongated downwardly extended bosses on each leg thereof, said bosses having vertically aligned elongated apertures therein, a yoke extending along the outside surface of each side of said frame to

6

overlie said bosses thereon, shafts extending through said apertures and secured to said yokes, rollers on said shafts between the downwardly extending legs of said frame, a bar extending between said yokes, and secured thereto and extending through elongated apertures in said downwardly extending legs of said frame, a vertical shaft extending upwardly from said bar and projecting through the upper wall of said frame, means associated with said last shaft and frame for vertically adjusting said shaft relative to said frame and thereby vertically adjusting said yokes and rollers, a rotatable brush mounted in the forward end of said frame forward of said shafts and rollers and means for rotating said brush.

6. The combination as claimed in claim 5 wherein each of said shafts extending through said apertures in said bosses carries a plurality of rollers, each of which is independently revoluble, and has a rubber-face for contact with a work surface.

7. In a device of the character described, a framework forming a chamber having an open bottom and end, a brush revolvably mounted in the open end of said chamber and substantially closing same, valved means carried on said frame for supplying said brush with liquid including a member adjacent the path of travel of said brush to emit liquid to impinge thereon in a direction perpendicular to the axis thereof whereby said brush is wet by a liquid before it contacts a work surface, a motor mounted on said framework and connected to said brush to drive the same, control means for said motor, a pair of shafts extending across said frame and positioned thereon rearwardly of said brush, rollers carried by said shafts and adapted to engage a work surface, and means mounted on said frame above said shafts for simultaneously adjusting both said shafts and the rollers thereon whereby the application of said brush to the work surface may be adjusted, and handles projecting upwardly from said framework at opposite ends thereof.

GEORGE HABIAN.

References Cited in the file of this patent UNITED STATES PATENTS

Number	Name	Date
893,488	Hall	July 14, 1908
1,536,615	Majusick	May 5, 1925
1,816,054	Pelkey	July 28, 1931
1,881,129	Peek	Oct. 4, 1932
1,904,974	Hoover	Apr. 18, 1933
1,991,794	Cutright	Feb. 19, 1935
2,069,700	Emmons	Feb. 2, 1937
2,247,970	Smith	July 1, 1941
2,277,236	Kneisley	Mar. 24, 1942
2,323,082	Ballard	June 29, 1943
2,454,650	Harris	Nov. 23, 1948