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J. B. HADAWAY

CLEANING MACHINE

Filed June 14, 1919

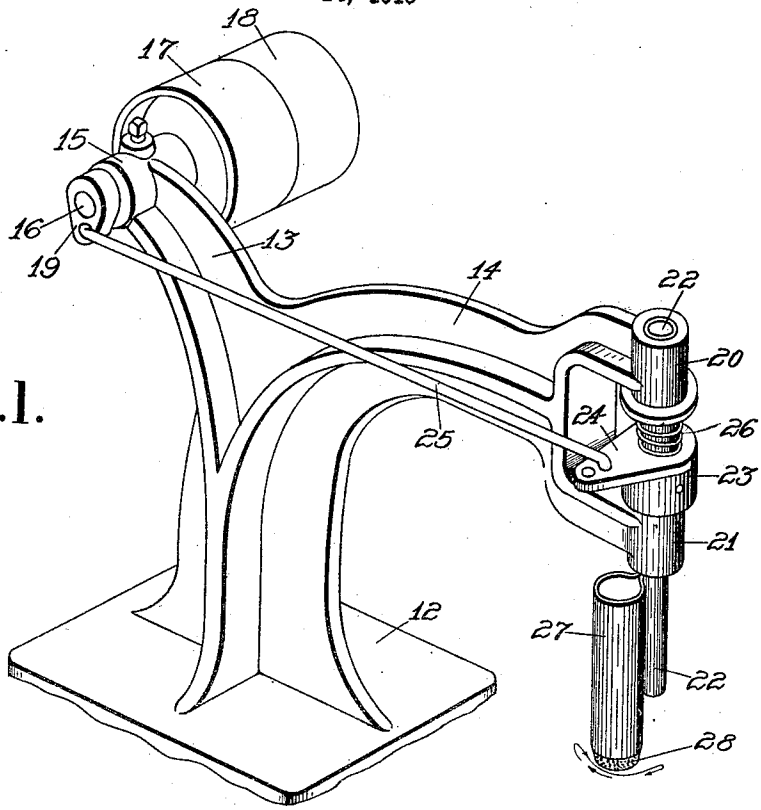


Fig.1.

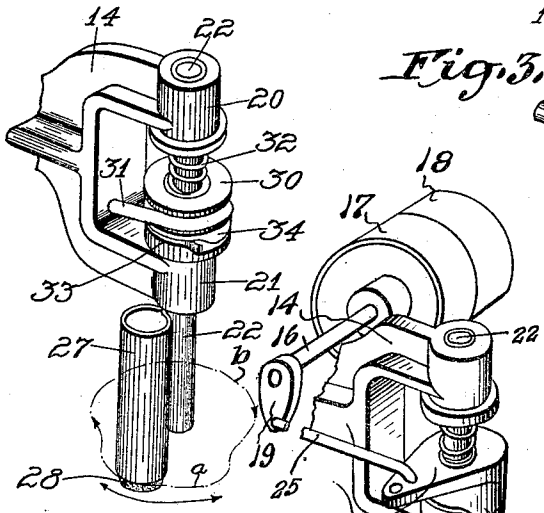


Fig.2.

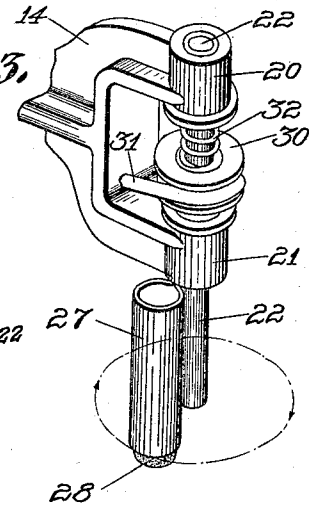


Fig.3.

Fig.4.

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UNITED STATES PATENT OFFICE.

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CLEANING MACHINE.

Application filed June 14, 1919. Serial No. 304,237.

To all whom it may concern:

Be it known that I, JOHN B. HADAWAY, a citizen of the United States, residing at Swampscott, in the county of Essex and State of Massachusetts, have invented certain Improvements in Cleaning Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to the cleaning of such material as shoe uppers of cloth or leather, when such material has become soiled.

The present practice of cleaning shoe uppers, particularly when the shoes are to be packed for shipment, is to rub the material, by hand, with an erasing substance such as rubber. This practice has the advantages that there is no oil which can be thrown off so as to get on the goods, and there is no abrasion of the goods, and no separate cleaning fluid or similar substance is required.

Important features of the present invention reside in a novel organization of power-operated means which, while simulating the hand method of cleaning above referred to, and retaining the characteristic advantages thereof, render the output uniform as compared with hand cleaned goods, and provide for performing the operation continuously at a faster speed than is possible when the work is performed manually.

Another objection to the ordinary hand method of cleaning colored shoe uppers by a rubbing action with gum is that the operator usually rubs the material longitudinally or in one plane so as to result in making a "smooch" upon the goods. A further important feature of my invention resides in the provision of novel means whereby the cleaning element always moves in a curved path and also toward and from the work so that, as the material is shifted along while in contact with the cleaning material, the rubbing lines upon the goods are constantly crossing each other.

With these and other features of my invention, which will be hereinafter more specifically referred to, the invention consists in the cleaning device substantially as hereinafter described and claimed.

In the drawings,

Fig. 1 is a perspective view of one machine or device embodying my improvements.

Figs. 2, 3 and 4 are views similar to a portion of Fig. 1, but illustrating other embodiments of my invention.

Referring first to Fig. 1, a suitable base 12 is formed or provided with a standard having arms 13, 14. At the end of arm 13 is a bearing 15 in which is mounted a shaft 16 having means for rotating it such as fast and loose pulleys 17, 18. The shaft also carries a crank 19.

At the end of arm 14 are bearings 20, 21 in vertical alinement, a spindle 22 being mounted in said bearings and having a hub 23 carrying an arm 24 secured to it. A link 25 connects the crank 19 with the arm 24, the connection of the link 25 with the arm 24 being preferably such that the amount of throw or degree of oscillation that can be imparted to the arm 24 and spindle 22 may be varied. As shown in Fig. 1, the means for varying said throw may consist of a plurality of holes in the arm 24, the end of the link 25 being adapted to be engaged with either one of said holes.

The spindle 22 is preferably adapted to be shifted endwise in the bearings 20, 21, a spring 26 confined between the bearings 20 and the hub 23 serving to yieldingly hold the spindle 22 and the rubber, presently described, in its lower position. Suitably attached to the lower end of the spindle 22 and at one side of the axis thereof is a holder 27 for the cleaning material 28. As shown, said holder is open from end to end to enable a piece of the cleaning material to be inserted and then, as it wears, to be adjusted as by pushing it down. The holder 27 may be of any shape or kind and may be provided with any suitable means for gradually ejecting or pressing the material 28 down as it wears. The cleaning material 28 is preferably what is known as "art gum", and it is so carried by the holder 27 as to project at the lower end of the latter.

When the machine of the type illustrated in Fig. 1 is in operation, a short radius of oscillation is imparted to the holder 27 and the rubbing material 28, which latter has a combined twisting and oscillating movement relatively to the work which will

be fed along, in contact with the lower end of said material, by the operator.

The holder 27 may be supplied with new material either through an open upper end and may be fed downward by any suitable device not necessary to illustrate, or the holder may be otherwise constructed to carry renewable pieces of cleaning material in such condition that the latter will be in exposed position for engagement with the work.

In Fig. 2 the parts having the same reference numerals as in Fig. 1 are or may be the same in structure. Said figure, however, illustrates means whereby the holder and the rubber carried thereby moves in a complete circular path instead of oscillating. For this purpose a pulley 30 is secured to the spindle 22, said pulley and the spindle and the rubber being rotated by means of a belt 31. A spring 32 confined between the bearing 20 and the pulley 30 yieldingly holds the spindle in its lower position, but at the same time permits the spindle to be either shifted upwardly by the operator's pressure of the work against the rubber, or to cause the spindle and its rubber to shift vertically, this latter movement being effected by means of a stationary cam rib 33 which may be a part of the bearing 21, and a cam 34 carried by the pulley 30.

In Fig. 1 I have indicated, by arrows adjacent the rubber 28, the approximate path of movement which said rubber has relatively to the work. In Fig. 2 I have indicated by the line *a* the path which the rubber follows when the cam 34 is not riding on the cam rib 33, the line *b* indicating the path in a higher plane which is followed by the tip of the rubber 28, while the cam 34 is riding over the cam rib 33. In plan view the lines *a* and *b* would, of course, describe a circle. Fig. 2 being a perspective, however, the lines *a* and *b*, by comparison, indicate that during a part of the rotation of the rubber its tip is in a lower plane than when said tip is moving through that portion of the path indicated by the line *b*. This, when the work is being fed along by the operator, results in the rubber making a rapid series of rubbing contacts with the work, all of which will be in the same direction but, owing to the feeding the work along, the curved lines or paths of rubbing contact will cross each other.

In Fig. 5 the structure is substantially the same as in Fig. 2 excepting that the cam and cam rib are omitted so that the tip of the rubber 28 moves in a circular path of uniform plane.

The modification shown in Fig. 4 is the same as that shown in Fig. 1 except that cam 34 and cam rib 33 have been added to produce a light pounding against the work.

The actuating mechanism in Fig. 1 is preferable because the rubbing path of contact with the work is not only curved, but is also back and forth so as to very closely simulate the most effective rubbing movement that is performed manually. This movement is particularly effective because there is a continual flexing of the tip of the rubber back and forth at the ends of the rubbing strokes.

Of course, any means for removing the small particles of rubber which will be continually leaving the cleaning material may be employed, such as suitable brushing or vacuum devices not necessary to illustrate.

When the modification shown in Fig. 4 is used the tip of the cleaning material 28 will have not only the peculiar back and forth rubbing movement in a curved path, but also will be rapidly moved to and from contact with the material. Owing to the fact that the work is held against the tip of the material 28, and the fact that the said material and its holder may yield, due to the spring 26, the cam mechanism of Fig. 4 will result in constantly varying the amount of pressure or contact with the work because the mere act of the operator in presenting the work to the rubber will cause the work to tend to somewhat follow any vertical movements of the rubber so that, as the latter reciprocates or oscillates, it has a motion which might be compared somewhat to a light hammering contact between the rubber and the work.

By the term "rubber" employed herein I mean to include any material which cleans by a rubbing action, whether the material be "art gum" or caoutchouc, or some equivalent thereof, which cleans without abrasion or without the addition of some other substance. When "art gum" is employed, it is desirable to strengthen it to reduce its liability to break. Such strengthening may be effected by a core of tough or fibrous material.

Having described my invention, what I claim is:—

1. A cleaning device of the character described comprising a rubber carrier mounted to move about an axis offset from the center of the rubber and open from end to end to enable the rubber to be adjusted therein, and means for actuating said carrier.

2. A machine of the character described comprising a work-engaging member, and mechanically actuated means for moving it bodily in the plane of the work and intermittently toward and away from that plane.

3. A machine of the character described comprising a spindle having a holder at one side of the axis of said spindle, cleaning material carried by said holder, said holder comprising a tube open from end to end to

enable the cleaning material to be adjusted therein, and means for actuating said spindle axially.

4. A cleaning machine of the character described comprising, in combination, a cleaning member, means for moving said member in engagement with a piece of work, means to press said member against the work, and means intermittently to vary the pressure on said member.

5. A machine of the character described comprising a holder having rubbing material, and mechanism for imparting to said holder co-ordinated movements in different planes to move the rubbing material in a three-dimensional orbit.

6. A machine of the character described comprising a spindle having a tubular holder laterally offset therefrom, a rubber adjustably fitted within said holder so as to protrude from one end thereof, and means for shifting the holder around the axis of the spindle.

7. A machine of the character described comprising a spindle having a holder, a rubber carried by said holder, and means for imparting reciprocatory and oscillatory motion to the spindle and holder.

8. In a machine of the class described, in combination, a work-engaging member, a rotary shaft, and adjustable connections therebetween to impart movement to said member in a three-dimensional path which may be varied by changing the adjustment of the connections.

9. In a machine of the class described, in combination, a cleaning member, means to move said member bodily about an axis located exteriorly of the cleaning member and in engagement with a piece of work to be cleaned thereby, and mechanically operated means rapidly to pound said member against the work.

10. In a machine of the class described, in combination, a holder, cleaning material adjustably mounted therein to be advanced as it wears away, a rotary shaft, and connections therebetween to oscillate said holder bodily to and fro once for each rotation of the shaft, said connections being adjustable to vary the extent of the oscillations.

11. In a machine of the class described, in combination, a work-engaging member, a rotary shaft, and connections therebetween to move said member bodily in engagement with a piece of work and to move it intermittently toward and from the work.

12. A machine of the class described having, in combination, a work-engaging member, a rotary shaft, and connections between said member and shaft to move the former about an axis located exteriorly thereof and to pound it against the work, said connections including coacting parts arranged to be separated or brought together according to the pressure of the work against said member so that varying said pressure will vary the pounding action of said member.

13. A cleaning machine comprising, in combination, a flexible stick of cleaning material, a support therefor, and mechanism to move the support back and forth with the stick in rubbing engagement with a piece of work, the stick and support being relatively arranged so that the stick flexes reversely at opposite ends of its rubbing strokes in imitation of hand manipulation, for the purpose described.

14. A machine as defined by claim 13, in combination with a cam for intermittently varying the pressure of the cleaning material on the work.

In testimony whereof I have signed my name to this specification.

JOHN B. HADAWAY.