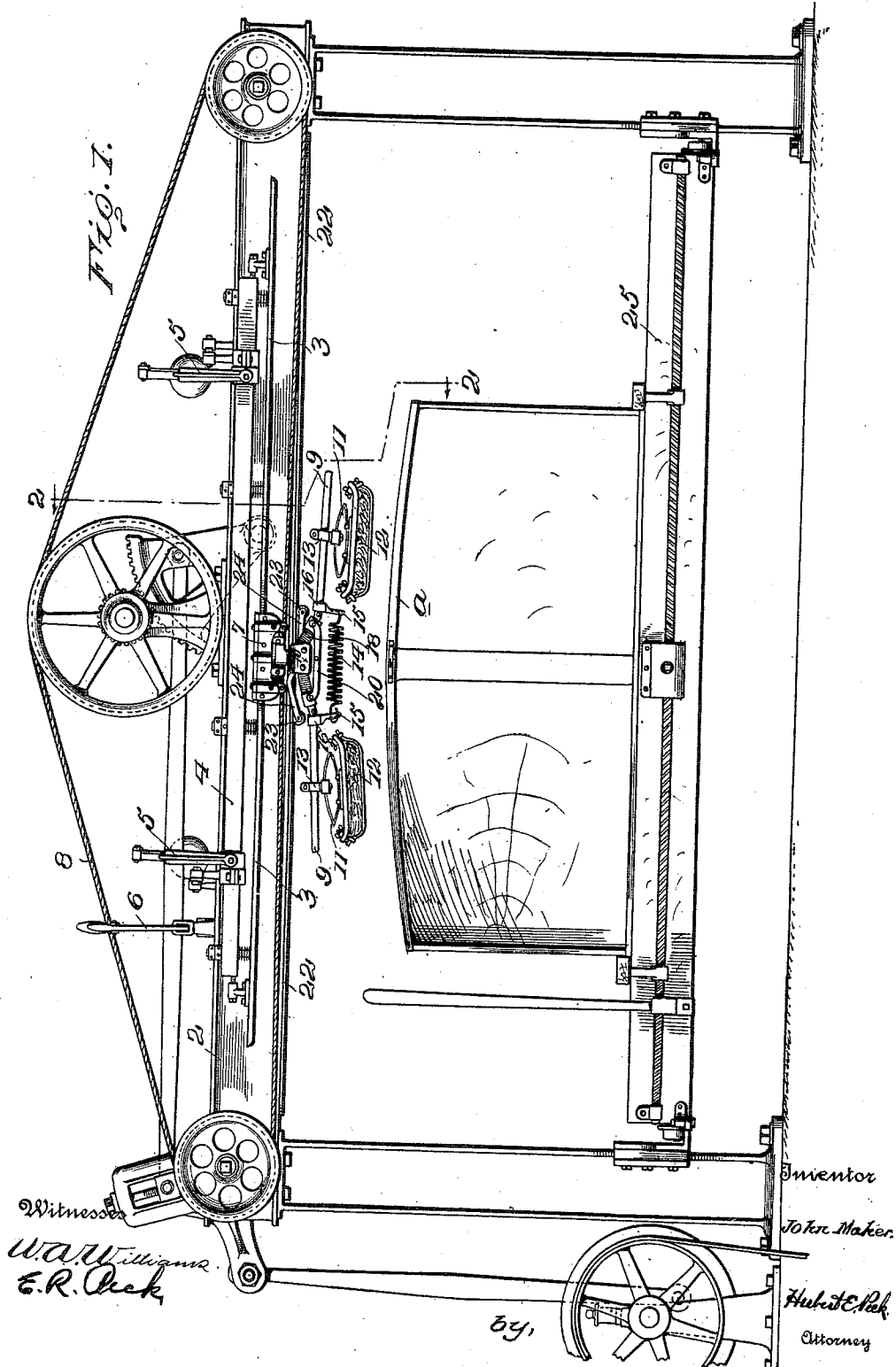


J. MAHER.
SANDING MACHINE AND THE LIKE.
APPLICATION FILED OCT. 24, 1910.

994,594.

Patented June 6, 1911.

3 SHEETS—SHEET 1.

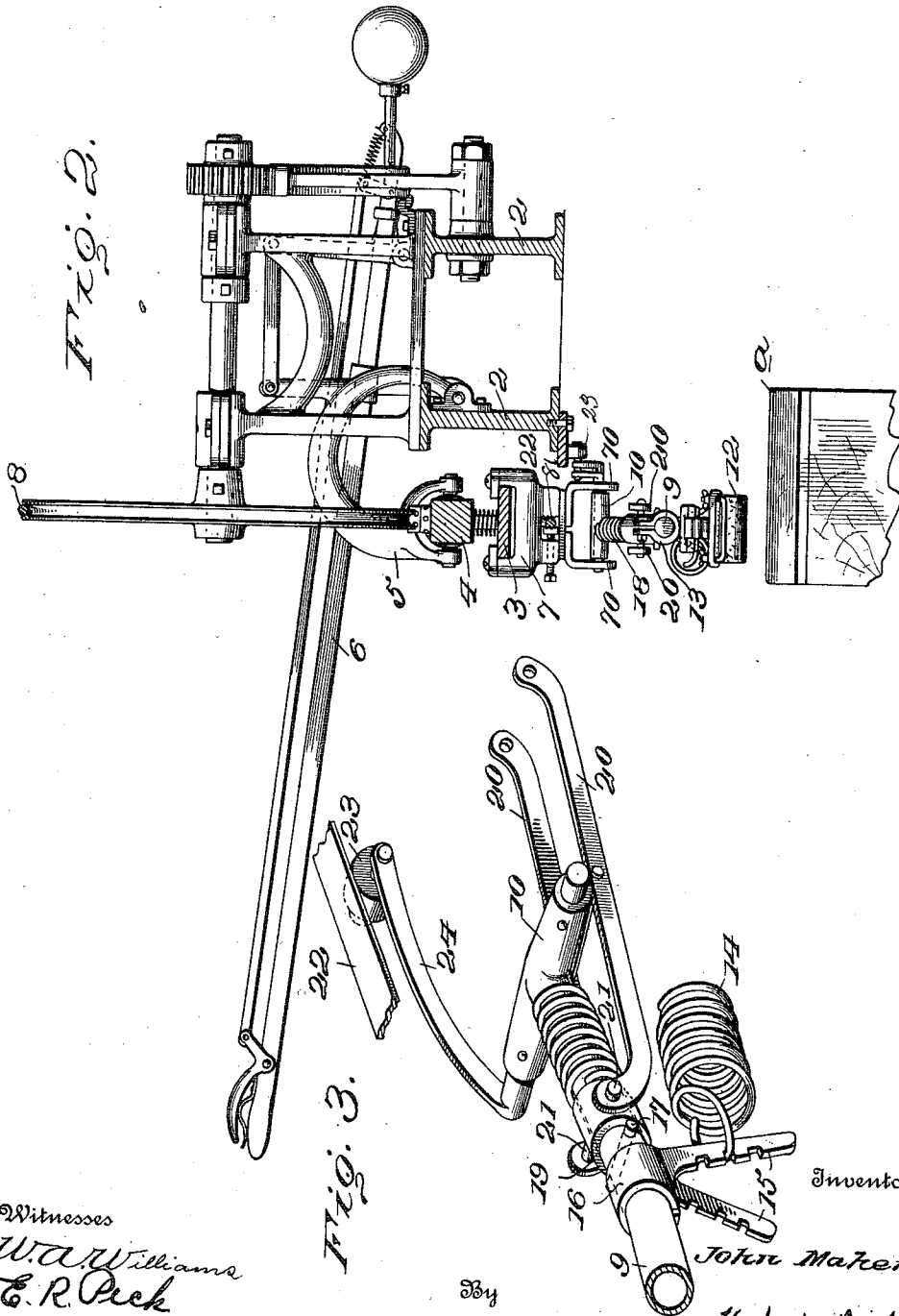


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3 SHEETS-SHEET 2.



Witnesses
W. A. Williams
E. R. Peck

Fig. 3.

By

Inventor

John Maher

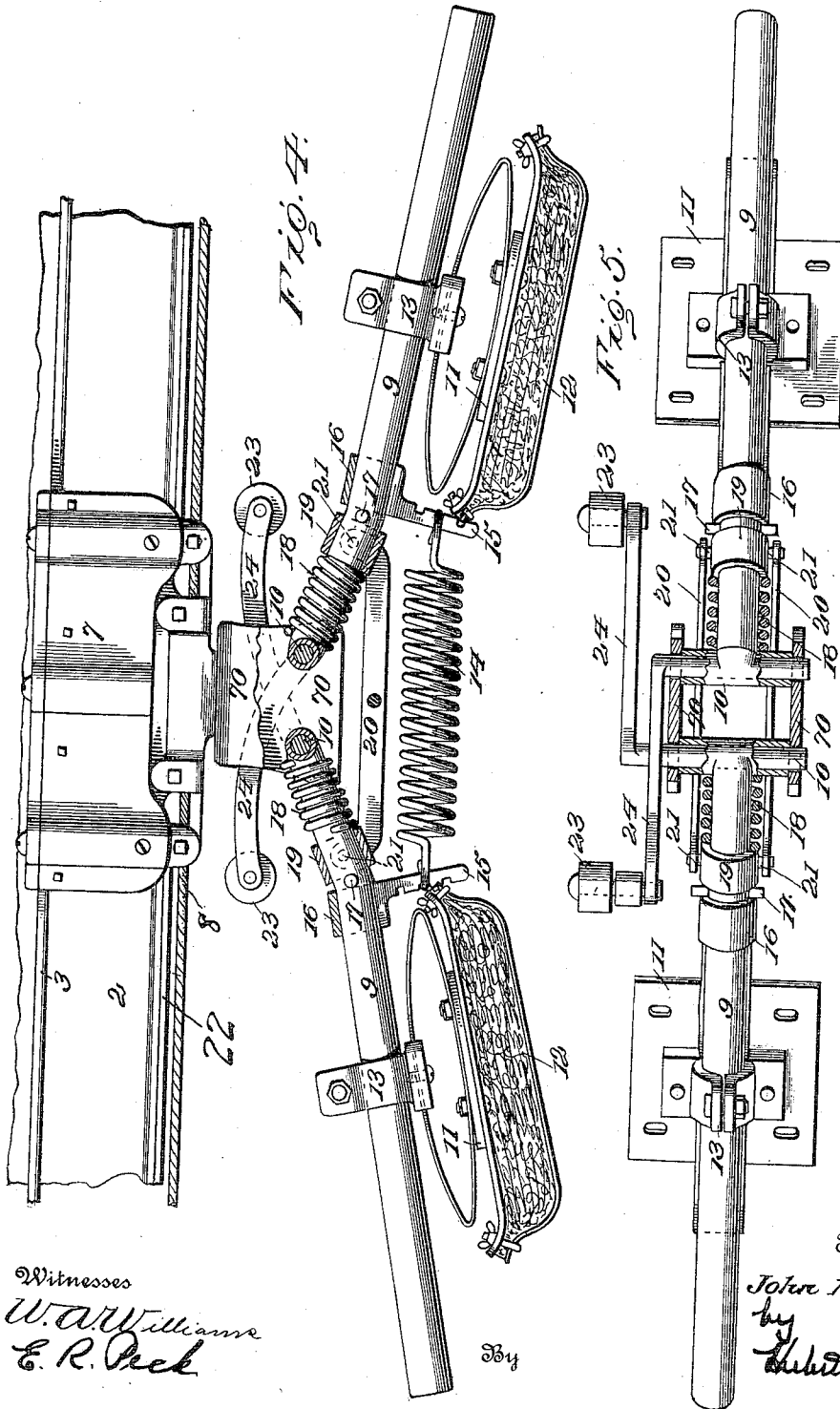
Kubert & Peck
Attorneys

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3 SHEETS—SHEET 3.



Witnesses
W. A. Williams
E. R. Oak

By

Inventor
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UNITED STATES PATENT OFFICE.

JOHN MAHER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO POOLEY FURNITURE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

SANDING-MACHINE AND THE LIKE.

994,594.

Specification of Letters Patent. Patented June 6, 1911.

Application filed October 24, 1910. Serial No. 588,823.

To all whom it may concern:

Be it known that I, JOHN MAHER, a citizen of the United States, residing at Philadelphia, Philadelphia county, Pennsylvania, have invented certain new and useful Improvements in and Relating to Sanding-Machines and the Like; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in wood polishing, rubbing or sanding machines; and the objects and nature of the invention will be readily understood by those skilled in the art in the light of the following explanation of the accompanying drawings showing what I now consider my preferred embodiment from among other formations and arrangements within the spirit and scope of my invention.

An object of the invention is to provide, what might be termed, an attachment for any suitable sanding machine, such for instance as those now in common use, whereby curved surfaces, such as bulged fronts of furniture, and the like, can be efficiently and economically polished or rubbed by machinery.

A further object of the invention is to provide certain improvements in sanding machines and the like, whereby curved or rounded surfaces can be conveniently and efficiently operated upon.

The invention consists in certain novel features in construction and in combinations and arrangements as more fully and particularly described and specified hereinafter.

Referring to the accompanying drawings;—Figure 1, is a front elevation of a complete sanding or polishing machine, my invention being shown applied thereto and in elevated or inoperative position raised from the work. Fig. 2, is a cross section on the line 2—2, Fig. 1. Fig. 3, is a detail perspective showing parts of the attachment embodying my invention. Fig. 4, is a detail front elevation of the parts embodying my invention shown in lowered operative position. Fig. 5, is a top plan view of the attachment, partially shown in horizontal section.

It has heretofore been the common prac-

tice to rub or polish curved surfaces such as bulged furniture fronts, drawer fronts and other curved parts by hand which is a comparatively slow and expensive process as compared with the method of performing this work by power driven apparatus.

This invention contemplates the provision of improved means whereby power driven machines provided with means for operating only on plane surfaces can be utilized for rubbing such bulged or curved work as mentioned.

In the drawings, 1, are the frame uprights of the common sanding machine carrying the longitudinal fixed top or horizontal frame 2.

3, is the longitudinal horizontal track or rail of the ordinary sanding machine suitably coupled to and carried by a longitudinal pressure bar 4, all arranged in front of and parallel with the longitudinal frame 2, and vertically movable with respect thereto and carried thereby through the medium of certain levers 5, and raised and lowered to and from operative position by the vertically movable forwardly projecting hand lever 6, as will be readily understood by those skilled in the art. A carriage or slide 7, is mounted on and reciprocates longitudinally of the track 3, and depends therefrom to receive the rubbing element. In the machines now in general use this carriage 7, is secured to and included in an endless flexible cable 8, and is reciprocated thereby, suitable means being provided for actuating, controlling and guiding said cable and reversing the direction of movement thereof to carry the carriage its full stroke back and forth on the rail.

The machine in general use for rubbing flat plane surfaces provides a hanger depending from carriage 7, to receive the rubbing element consisting of a single pad. The mechanism comprising my invention is hung from and supported by and moves with the carriage 7, and comprises a pair of vertically swingable outwardly and downwardly diverging arms or levers 9, at their upper ends having horizontal T's or cross heads 10, fulcrumed or journaled in flanges 70, depending from the carriage. The two cross heads 10, are parallel and spaced a distance apart and the diverging levers 9,

are arranged in the same vertical plane. The lower free ends of the levers are vertically movable, the transverse cross heads forming the axes on which the levers rock. The diverging straight free ends of the two levers 9, carry the depending holders 11, which detachably receive any suitable rubbing, sanding or polishing pads or elements 12, depending from the holders. In the example illustrated, I show the holder 11 and pad 12 of the construction in common use and I do not herein claim this particular construction of holder and pad, *per se*. In carrying out my invention, I provide each holder 11, with an upwardly projecting clamp 13 (here shown as an adjustable split ring or clamp) fitted on and adjustable longitudinally of a lever 9, and capable of being tightened to rigidly hold the clamp and the holder 11, carried thereby at the desired position longitudinally of the lever. The two holders and their pads are thus adjustable to vary the distance between the two pads, and each holder is independently adjustable on its lever. The free or pad carrying ends of the two levers are yieldingly pressed or held downwardly by any suitable spring mechanism. For instance, if so desired, this pressure mechanism can comprise a coiled retractive spring 14, at its opposite ends adjustably attached to the two levers through the medium of arms 15, depending from sleeves or collars 16, loose on the upper portions of the levers and held up by said spring against stop pins 17, projecting radially from and rigid with said levers. It will thus be noted that the free ends of the levers can be raised only against the tension of spring 14, and that the upward movement of the free end of either lever will increase the depressing tension of the spring on the opposite lever. Each lever is also provided with a coiled expansive spring 18 arranged on the upper end thereof and compressed between the lever cross head 10, and a loose collar or sleeve 19, freely movable longitudinally of the lever so far as permitted by the spring 18, and stop pin 17. The spring 18, normally holds said collar outwardly on the lever against stop 17. In this connection, it might be noted that in the specific example illustrated, each lever has its upper end bent or deflected upwardly about at the stop pin 17, at a slight angle from the axial line of the lower or free end of the lever. The two spring held loose collars 19, of the two levers are directly connected together by a cross or evener frame or link 20, horizontally arranged below the carriage and directly between the two collars and having up-turned ends straddling said collars and pivotally joined thereto by transverse pivot pins 21. The arrangement of the cross connection 20, collars 21, and springs 18, is

such as to establish a limit of downward swing of the free ends of the levers under the tension of spring 14, whereby further downward swing of the levers is stopped by the engagement of the collars 19, with the stops 17, and when at this limit of downward swing on axes 10, upward swing of the levers on said axes 10, is yieldingly resisted by the springs 18, inasmuch as upward swing of either lever would (by reason of the cross connection 20) cause the collar 19, of such lever to slide on the lever toward lever axis 10, and against the tension of its spring 18. It will thus be noted that the springs 18, in connection with the cross connection 20, having spring abutments (collars) 19, will yieldingly hold the levers and their pads down to the work without the employment of the spring 14, which in this instance merely constitutes an additional tension device for depressing the levers.

For the purpose of lifting the levers and their pads from the work, to permit shifting or removal of the work when the rail 3, is raised from operative position, I provide a stationary horizontal track 22, longitudinally of and secured to the top frame 2, and at its longitudinal bottom face adapted to be engaged by rollers 23, on the free ends of crank arms 24, rigid with the rear projected ends of the lever axes, fulcrums or cross heads 10. Each lever has a crank arm 24, extending upwardly and outwardly practically in lengthwise or longitudinal continuation thereof, so that depression of the crank arms will raise the pad carrying ends of the levers against the tension of the springs controlling said levers.

The work, as indicated by *a*, Fig. 1, wherein is shown the curved or bulged front of a drawer to be rubbed or polished or sanded by the machine, that is by pads 12, is carried by any suitable work table such as 25, now employed in the common sanding or rubbing machine. In operation, the rail 3, is lowered by the controlling lever 6, to bring the pads 12, with the desired pressure upon the curved surface of the work and the pads are primarily held to the work with the desired pressure by this controlling lever, as the carriage 7, is reciprocated back and forth. The rubbing pads are adjusted on the levers according to the length of the work, and are so arranged that the paths of movement of the two pads will overlap at the elevated or central portion of the work. In other words, one pad will rub the surface being worked from one end to a point beyond the center of the length of the surface, and the other pad will operate from the opposite end of the surface to a point beyond the center toward the first named end. Each pad operates over a length of surface greater than one half the full length of the surface

being worked, so that the surface is operated on throughout its full length. The levers and spring mechanism cause the pads to follow the curved surface being worked, and rise and fall therewith, and yet maintain the desired tension of the pads thereon when the pads are at the lower portions of the surface as well as when they are at the upper portions thereof. The arrangement of the mechanism is such that an approximately uniform tension of the pads on the work is maintained notwithstanding the fact that when one pad is following down a descending curve the other pad is moving up an ascending curve. When the operator desires to remove the work, or to shift the position thereof to bring a fresh surface into the path of movement of the pads, the controlling lever 6, is operated to raise the rail 3, and the reciprocating carriage, and the rollers 23, engaging the stationary track 22, thereby depress the lever crank arms 24 and elevate the pad carrying ends of the levers against the tension of the several springs 14, 18, and thereby elevate the pads from the work so as not to interfere with the removal or shifting thereof. The common sanding or rubbing machines, of the general type illustrated, are usually provided with a catch, lock or dog, whereby the parts can be thus held in elevated or inoperative position.

The attachment can be readily applied to and removed from rubbing machines of the general type illustrated, and this attachment is of wide adaptability, by the adjustments provided for, to bulging fronts and furniture parts of various lengths and curves. Various kinds of pads can be applied thereto according to the work to be performed thereby and I use the term "pad" herein in a broad sense to include any rubbing or other element for operating on or surfacing the work under treatment. The pads holding sand paper of different numbers may be used to sand bulging fronts.

It is evident that various changes, modifications and variations might be resorted to without departing from the spirit and scope of my invention and hence I do not wish to limit myself to the exact disclosure hereof.

What I claim is;—

1. A reciprocating carrier in combination with a pair of pad carrying elements rockable on adjacent spaced axes and yieldingly held toward the surface to be operated on, and an evenner mechanism operatively connecting said elements to maintain approximately uniform tension thereof on the work.

2. Mechanism for rubbing curved surfaces comprising a vertically movable reciprocating carrier, diverging levers carried thereby and yieldingly held toward the surface to be operated on and provided with

pad holders to swing said levers from the work as said carrier is elevated, and a fixed track parallel with the path of reciprocation of said carrier and cooperating with said levers, substantially as described.

3. Mechanism for the purpose substantially as described comprising a vertically-movable horizontally reciprocatory carrier, a vertically rockable lever fulcrumed thereto and extending therefrom at an inclination toward the surface to be operated on and at its free end portion provided with means for carrying a pad, a spring mechanism for yieldingly holding the free end portion of the lever toward said surface, and a fixed horizontal track cooperating with said lever to rock the same and raise its pad carrying end from the work when said carrier is elevated.

4. Mechanism for the purpose substantially as described, comprising rockable spring-held levers at their free ends provided with means adjustable longitudinally thereof for carrying pads, an evenner mechanism between said levers and reciprocating means carrying said levers.

5. A reciprocatory carrier provided with a pair of diverging levers rockable independently of the carrier to follow the curvatures of the work and having spring means operating on both levers to yieldingly hold their free ends toward the work, an evenner mechanism operatively connecting said levers, and pad holders carried by said free ends.

6. A reciprocatory carrier provided with several yieldingly held pad-controlling and carrying means, pads carried thereby respectively, and movable therewith toward and from the work, evenner mechanism operatively connecting said several means and spring mechanism simultaneously acting on said several means and controlled by said evenner mechanism to maintain said several pad carrying means under approximately uniform tension in following the curvatures of the work.

7. Mechanism for operating on curved surfaces comprising a reciprocating carrier provided with separate pad-controlling and carrying means operative in different horizontal planes, an evenner mechanism between said separate means, and a pair of separate pads carried thereby and spaced apart one in advance of the other to operate respectively, from the central portion of the curved surface to the opposite ends thereof, whereby all of said pads operate on the central portion of the work.

8. Mechanism for rubbing curved surfaces comprising a reciprocatory carriage, and yielding spring-held pad-controlling and carrying means hung from and moving with said carriage longitudinally of said surface and comprising an evenner mechanism and

provided with a pair of spaced pads arranged one in advance of the other in the same vertical plane and yieldingly held to said surface and both operating over the central elevated portion of said surface and respectively operating toward the opposite ends of said surface.

9. Mechanism for operating on curved surfaces comprising a reciprocatory carriage movable transversely of its path of reciprocation and from operative position, pad-controlling and carrying members yieldingly held toward the surface to be operated on and carried by and moving with said carriage, and means independent of said carriage for engaging said members to lift the pads from the work when said carriage is lifted from operative position.

10. Mechanism for operating on curved surfaces comprising oppositely-extending pad-controlling-and-carrying members movable vertically to follow the curvatures of the work and operative at different elevations, means for reciprocating the same simultaneously longitudinally of the work, and spring mechanism comprising an everer simultaneously and uniformly acting on said several members and yieldingly and independently holding the same toward the work.

11. Mechanism for operating on curved surfaces comprising means for carrying a pair of spaced pads, mechanism for simultaneously reciprocating the same longitudinally of the work, and spring mechanism comprising an everer for maintaining an approximately uniform tension of both pads on the work when one pad is on a high portion thereof and the other pad on a low portion of the curved surface being operated on.

12. Mechanism for operating on curved surfaces comprising a carriage, diverging pad-controlling and carrying levers separately mounted therein and operative at different elevations in following the curvature of the work, spring mechanism simultaneously acting on both levers to yieldingly swing the same toward the work, under approximately uniform tension whatever the elevation thereof, and means for swinging both levers from the work to remove the pads therefrom.

13. Mechanism for operating on curved surfaces comprising a reciprocatory carriage, pad-controlling and carrying elements carried thereby and independently mounted therein, and an everer and spring mechanism acting on and connecting said members for maintaining an approximately uniform tension thereon when following both high and low portions of the curved surface operated on.

14. Mechanism for operating on curved surfaces comprising a carriage having a path of reciprocation longitudinally of the work, said carriage being also movable to-

ward and from the work, an adjacent stationary track arranged parallel with the path of reciprocation of the carriage, a pair of spring held pad-carrying-and-controlling levers fulcrumed in and depending from said carriage, and lever-lifting arms adapted to engage said track when the carriage is moved from the work to swing said levers from the work.

15. Mechanism for operating on curved surfaces comprising a carriage having a normal path of reciprocation longitudinally of the work, a pair of pad-carrying-and-controlling levers separately fulcrumed in said carriage, expansive coiled springs on said levers and engaging abutments at the upper portions thereof, longitudinally movable abutments on said levers for the opposite ends of said springs, stops limiting the outward movements of said movable abutments, and a connecting frame between said levers and pivotally joined to and connecting said movable abutments.

16. Mechanism for operating on curved surfaces comprising a reciprocatory carriage, a pair of depending pad-carrying-and-controlling levers fulcrumed therein and provided with lever lifting arms, and a spring device connecting and acting on said levers below their fulcrums and yieldingly holding the same toward the work.

17. Sanding or rubbing mechanism for operating on curved surfaces comprising a horizontally reciprocating carriage, means for moving the same toward and from the work to and from operative position, a pair of vertically rockable diverging pad carrying and controlling levers fulcrumed in said carriage and having elongated free ends, pad holders provided with clamps receiving and longitudinally adjustable on said free ends, and a spring device acting on both levers to maintain approximately uniform tension thereon when either lever is acting on a high portion of the work and the other lever on a low portion of the work, substantially as described.

18. Sanding or rubbing mechanism comprising a reciprocatory carriage, a spring held depending lever at its upper end having a cross head fulcrumed in said carriage and provided with a lateral lever lifting arm, a track to be engaged by said arm for lifting the lever, and a pad holder carried by the free end of the lever.

19. In a sanding machine, or the like, in combination; an elongated vertically movable carrier; a carriage movable vertically therewith and reciprocatory longitudinally thereof; a pair of spring-held, pad-carrying elements carried by said carriage and mounted therein to have a range of vertical movement independently of said carriage; and mechanism for simultaneously lifting said elements from the work within their

said range of independent movement when said carrier is lifted to raise said carriage from operative position with respect to the work.

5 20. In a sanding machine, or the like, in combination, a reciprocatory carriage; a pair of spring-held pad-carrying elements carried by said carriage and movable toward and from the work and respectively
10 operative at different elevations in following the curvature of the work; and mechanism simultaneously operative on said several elements for maintaining the same under uniform tension on the work when respectively
15 operating at different elevations, substantially as described.

21. In a sanding machine, or the like, in combination, a reciprocatory carriage; a pair of pad-carrying levers fulcrumed in
20 said carriage to rock vertically with respect to the work and having lever lifting arms; spring means yieldingly holding said levers toward the work; and means to engage said lifting arms for swinging the levers from
25 operative position with respect to the work, substantially as described.

22. In a sanding machine, or the like, in combination, a reciprocatory carriage; a pair of diverging pad-carrying levers at
30 their upper ends fulcrumed therein to swing vertically; laterally-extending lever-lifting arms rigid with the lever fulcrums; an elongated track to engage said arms to swing the levers and lift the same from the
35 work; pad holders carried by the outer ends of said levers; and a spring device acting on

said levers to yieldingly hold their outer ends toward the work.

23. In a sanding machine, or the like, in combination, a reciprocatory carriage; a pair of pad-carrying levers fulcrumed at
40 their upper ends therein to swing vertically, said levers having elongated diverging oppositely extending free lower ends; pad holders carried by said diverging ends and
45 provided with clamps adjustable longitudinally of said ends, whereby the distance between said holders can be varied according to the length of the work to be operated on; and spring mechanism simultaneously acting
50 on said levers to yieldingly hold said diverging ends toward the work.

24. In a sanding machine, or the like, in combination, a reciprocatory carriage provided with means for lifting the same from
55 operative position with respect to the work; diverging pad-carrying levers fulcrumed in said carriage to swing toward and from the work; spring mechanism acting on said levers to swing the same to yieldingly hold
60 their pads to the work; and means separate from said carriage for simultaneously rocking both levers against the tension of said spring mechanism to lift the pads carried
65 by the levers away from the work.

In testimony whereof I affix my signature, in presence of two witnesses.

JOHN MAHER.

Witnesses:

WM. H. DEWAR,
B. R. STAUFFER.