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1,602,397

H. E. DOW

HEATING TOOL

Filed March 9, 1922

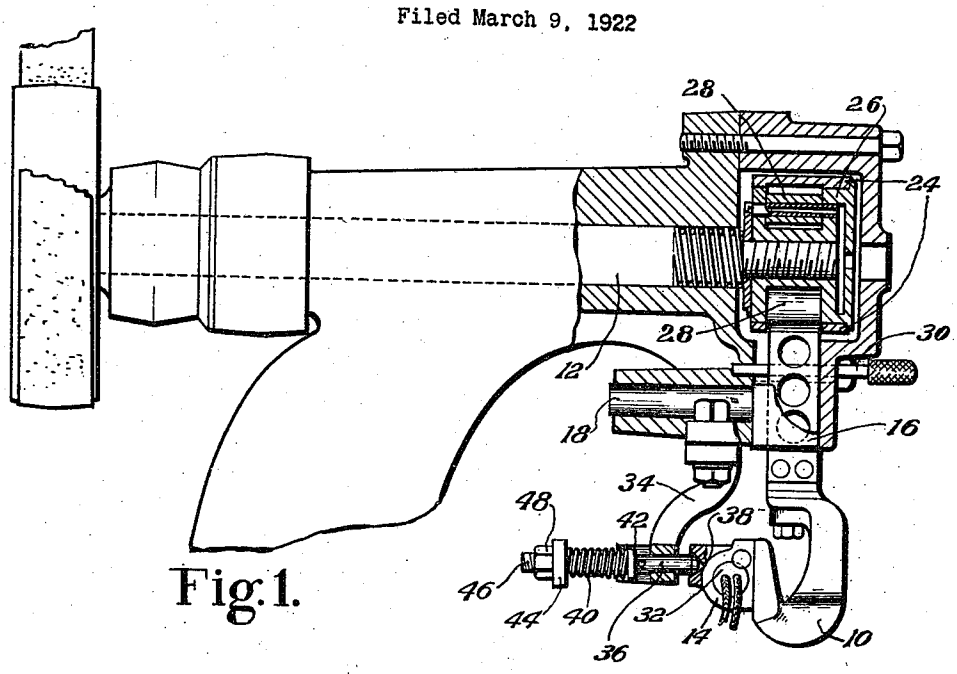


Fig. 1.

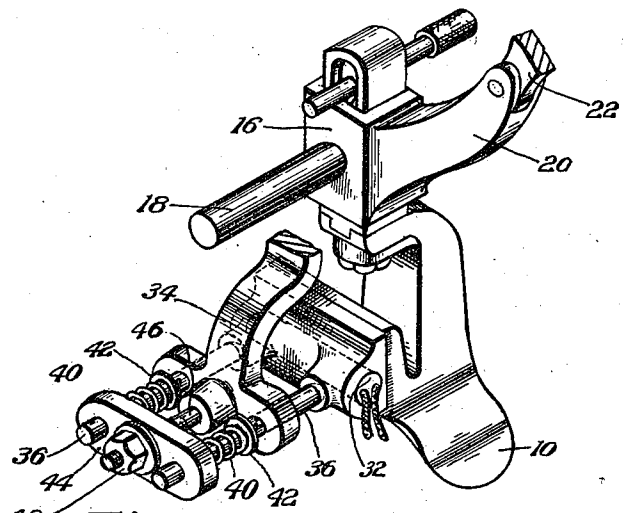


Fig. 2.

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UNITED STATES PATENT OFFICE.

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HEATING TOOL.

Application filed March 9, 1922. Serial No. 542,318.

This invention relates to machines for finishing shoes by ironing and smoothing them against their enclosed lasts, and to devices for heating shoe-engaging tools such as the ironing or smoothing tools of such machines, and it is herein illustrated as embodied in a machine of the general type disclosed in Patent No. 1,331,613, granted Feb. 24, 1920, on an application filed by C. M. Bradford and R. C. Simmons.

In the machine illustrated in the above-identified patent, an ironing tool is arranged to be reciprocated against a shoe by a cam or beater roll for removing wrinkles and otherwise shaping shoes, more especially turn shoes, against the enclosed lasts. This operation is of considerable importance in the manufacture of turn shoes after the insertion of the second lasts, inasmuch as the turning of the shoe unavoidably distorts and wrinkles the shoe materials to a greater or less extent.

In the arrangement of the machine shown in the said patent, the shoe engaging tool is heated by a gas flame. An object of the present invention is to substitute an electric heating device with its attendant advantages of cleanliness and uniformity of heat. It has previously been proposed to heat tools of this general character by yieldingly mounting a recessed block containing an electric heating unit so that it will be urged into sliding engagement with the tool to conduct heat thereto. Previous devices of this character, however, have been constructed and arranged to urge such a block about a fixed axis so that careful fitting of the co-operatively-engaging parts of the tool and the block is necessary in order to secure a full surface engagement. Thus if either the block or the tool is not accurately mounted, or if one of them is not carefully machined to form a true plane surface, or if one of them wears in such a manner as to become uneven, in any of these cases the sliding surface engagement between the tool and the block is lost and there is only a line engagement which decreases materially the efficiency of the conduction of the heat.

According to the present invention these difficulties are obviated by providing, in combination, with the shoe engaging tool of such a machine, a heated block or other member which is mounted to move in such a manner as to be held in substantially complete surface sliding engagement with the tool regardless of the exact relative position of the tool mounting and the mounting for the block. As illustrated the block is connected to a bracket mounted on the machine frame by spring means which provides a universal mounting for the block in such a manner that it may tilt about any axis which may be required in order to provide for such a substantially complete surface engagement.

Such a mounting for a heat transferring block is not only advantageous in compensating for inaccuracies in the relative mounting of the tool and the block, and in eliminating the necessity for carefully machining the engaging surfaces and for automatically compensating for unequal wear, but it is especially well adapted for use in heating tools which have a compound motion. It would be extremely difficult to mount tools of this character so accurately that any one surface would remain constantly in the same plane and consequently they are most efficiently heated by a block mounted in accordance with my invention so that it may automatically adjust itself to the position of the tool.

From a somewhat different point of view my invention may be regarded as providing a universal mounting for a heat-conducting member which can be made up in quantities as a stock heating device and applied to any one of a number of machines because of its capability of automatic adjustment to conform the position of the heat conducting member to that of the tool which is to be heated thereby.

Other features of my invention are to be found in a tool for use in a machine of the type illustrated in the above-identified patent and which is both rubbed and pounded against a shoe, and in various combinations and specific constructions which will be apparent from the following description of an embodiment of my invention illustrated in the attached drawings, in which—

Fig. 1 is a side elevation, partly in section, of a portion of a machine of the type shown in the above-identified patent with the improved device for conducting heat applied thereto; and

Fig. 2 is a detached perspective of the

shoe-engaging tool and the improved device for conducting heat thereto.

The machine illustrated in the attached drawings comprises generally a shoe engaging tool 10, illustrated as an ironing tool for use in smoothing out shoes which have been turned and relasted; a rotary shaft 12 and connections therefrom to operate the tool; and a heated member or block 14 in engagement with a surface of the tool to conduct heat thereto.

In order to secure in an efficient manner the advantages of rubbing and pounding the tool against the work as described in the above-identified Bradford and Simmons patent, there is provided an improved mounting for the tool according to which it is arranged for a sliding motion in a sleeve 16 mounted for oscillation about a shaft 18 journaled in the frame of the machine. On one side of this sleeve is formed an arm 20, to which is connected a lever 22 oscillated back and forth during the operation of the machine by a strap 24 surrounding an eccentric 26 mounted on one end of shaft 12. Operation of the eccentric 26 results in short rapid oscillations of the sleeve 16 which impart rubbing motions of the tool 10 back and forth in engagement with a shoe. At the same time the tool is rapidly vibrated or pounded against the shoe by means of percussional impulses imparted thereto by a series of beater rolls or cams 28 mounted concentrically with respect to shaft 12 in the eccentric 26. By this means, each time the tool 10 is given one back and forth rubbing motion it is given a series (as for example 7) of percussional impulses in a direction substantially perpendicular to the work. A pin 30 is inserted through co-operating holes in the machine frame and through a slot in the tool 10 to prevent the tool from dropping out of the sleeve 16. The pin 30 normally holds the tool just below the path of the rolls 28 so that when a shoe is pressed upwardly against the tool it will be moved into engagement with these cams or rolls in order to be operated on thereby.

The block 14 is illustrated as being recessed to contain an electric heat unit 32 and according to an important feature of my invention it is connected to a bracket 34 by a floating mounting such that the block can tilt automatically about any required axis in order to maintain full surface engagement with the co-operating portion of tool 10. Thus the necessity for accurate machining is diminished and arrangement is made for automatic compensation for wear, for movement of the tool in such a manner as to cause departure of the block engaging surface from its original plane, and for variations in the relative positions of the tool and bracket 34.

In the illustrated embodiment this floating mounting comprises plungers 36 seating in cup-shaped depressions 38 in block 14 and yieldably urged into these depressions to hold the block against the tool by means of springs 40 engaging collars 42 on the plungers and held under compression by a stop 44. Stop 44 is connected to bracket 34 by means of a bolt 46 and is adjustably movable thereon in order to vary the tension of springs 40 by turning the nut 48.

By this improved arrangement, it will be observed that block 14 is freely tiltable about an axis passing through the bottom of depressions 38 and that it may tilt about any other axis against a greater or less resistance from springs 40. Thus for example block 14 may move bodily; and it may also tilt about a vertical axis, or about a horizontal axis parallel to its tool engaging surface, or about a horizontal axis perpendicular to its tool engaging surface,—in fact the block 14 is held against tool 10 by a universal mounting which will cause automatic adjustment regardless of the exact position of the tool.

As above noted this type of mounting is not only advantageous for particular vibrating tools of the character illustrated, especially those which have a compound motion, but it is also well adapted for use as a stock device which may be made up in quantities and applied to any one of a number of machines, since there is no necessity for accurate fitting of the device to each machine in view of the automatic character of the adjustment of the heated block 14 to conform its position to the position of the tool which it is to heat.

While my invention has been described as embodied in the type of machine illustrated in the above-identified patent it is not my intention to limit its scope thereby or otherwise than by the terms of the appended claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a machine of the class described, in combination, a movable shoe-engaging member, and means to heat said member comprising a heated block and a universal mounting therefor allowing the block to adjust itself about any required axis to conform to the position of said member and be held in sliding contact therewith.

2. In a machine of the class described, in combination, a reciprocable shoe-treating tool, and means to heat the tool comprising a heated member and a yielding mounting therefor permitting both tilting and non-tilting movement of said member to adjust it to the position of the tool and hold it in sliding engagement therewith.

3. In a machine of the class described,

in combination, a reciprocable shoe-treating tool, and means to heat the tool comprising a heated member and a yielding mounting therefor permitting tilting about an axis parallel to the direction of movement of the tool and about an axis at right angles to the direction of movement of the tool to adjust it to the position of the tool and hold it in sliding engagement therewith.

4. In a machine of the class described, in combination, a movable shoe making tool, and means to heat the tool comprising a heated block arranged to tilt about any one of a plurality of axes to conform to the position of the tool and be held in sliding engagement therewith.

5. In a machine of the class described, in combination, a movable shoe-engaging tool, and a heated block mounted for universal movement to conform to the position thereof and be held in sliding engagement therewith.

6. In a machine of the class described, in combination, a movable shoe-engaging tool, a heated member to transmit heat thereto, and springs urging said member into engagement therewith, said member being mounted to allow it to tilt about any one of a plurality of axes to conform to the position of the tool.

7. In a machine of the class described, in combination a movable shoe-engaging tool, and a heated block capable of independent bodily and angular movements in sliding engagement therewith to transmit heat thereto.

8. In a machine of the class described, in combination, a movable shoe-engaging tool, a heated block to transmit heat thereto, and a sliding plunger yieldingly urged against the block to support the block with provision for relative movement between the block and the plunger and to press the block against the tool.

9. In a machine of the class described, in combination, a movable shoe-engaging tool, a recessed block to contain an electric heat unit and to conduct heat therefrom to said tool, and yielding means urging said block against the tool and allowing it to tilt and also to change its position bodily without tilting to conform to the position of the tool.

10. In a machine of the class described, in combination, a movable shoe-engaging tool, a recessed block to carry an electric heat unit and conduct heat therefrom to said tool, a plurality of plungers engaging the block, and a separate spring urging each plunger against the block so that the plungers may yield independently to allow the block to conform its position to the position of the tool.

11. In a machine of the class described, in combination, a movable shoe-engaging tool, a recessed block to carry an electric heat unit and conduct heat therefrom to said tool, a plurality of plungers engaging the block, a separate spring urging each plunger against the block so that the plungers may yield independently to allow the block to conform its position to the position of the tool, and means to vary the tension of the springs.

12. In a machine of the class described, in combination, a movable shoe-engaging tool, a recessed block to contain an electric heat unit and conduct heat therefrom to the tool, and a mounting therefor adapted to permit tiliting of the block about a plurality of axes and comprising springs arranged to resist tilting of the block about an axis parallel to the direction of motion of the tool and to urge the block against the tool.

13. In a machine of the class described, in combination, a movable shoe-engaging tool, a recessed block to contain an electric heat unit and conduct heat therefrom to the tool, and a plurality of plungers urging the block toward the tool and arranged to allow universal motion of the block, said plungers being mounted for independent yielding.

14. In a machine of the class described, in combination, a movable shoe engaging tool, means to heat the tool comprising a heating unit adapted slidingly to engage the tool, and a support for the heating unit, the support being relatively stationary with respect to the tool and connected with the heating unit to permit free relative movement between the support and the heating unit.

15. In a machine of the class described, in combination, a movable shoe engaging tool, and a heated block in sliding engagement therewith and freely tiltable about an axis perpendicular to a direction of motion of the tool and also tiltable about a second axis against a yielding resistance to adjust the block for varying positions of the tool.

16. For mounting on any one of several machines used in manufacturing shoes, a stock tool-heating device comprising a recessed block to contain an electric heat unit, a bracket to be attached to a machine frame, and a universal connection between the bracket and the block arranged automatically to adjust the position of the block to the position of the tool to be heated, to secure a surface sliding engagement between the block and the tool regardless of tilting movements of the tool about different axes.

17. For mounting on any one of several machines used in manufacturing shoes, a stock tool-heating device comprising a recessed block to contain an electric heat unit, a bracket to be attached to a machine frame, and a spring connection between the bracket and the block allowing the block to move bodily and to tilt about a plurality of axes to bring about a sliding surface engagement

between the block and a tool to be heated thereby.

18. In a machine of the class described, in combination, a shoe engaging tool, a heating device for conducting heat to the tool, means to exert pressure upon the heating device in such a manner as to support it and hold it in frictional engagement with the tool and means to vary and to control the amount of pressure exerted.

19. In a machine of the class described, in combination, a movable shoe-engaging tool, a recessed block to contain a heat unit and transmit heat therefrom to the tool, said block being formed with a cup-shaped depression in the outer surface opposite to the tool, and a plunger yieldingly held in the depression to hold the block in place and to urge it into engagement with the tool while allowing ready removal of the block.

20. In a machine of the class described, in combination, a movable shoe-engaging tool, a heated block in sliding engagement therewith, a plunger connected to the block by a universal joint to allow it to adjust its position to that of the tool, and a spring acting on the plunger to urge the block against the tool.

21. In a machine of the class described, in combination, a movable shoe engaging tool, a movable guide therefor to control the path of movement of the tool, means to move the tool in the path determined by the guide, means for moving said guide to impart additional movement to the tool, and a heated block automatically to vary its position to remain in sliding surface engagement with the tool.

22. In a machine of the class described, in combination, a shoe engaging tool slidingly and angularly movable, a heated block to be held in sliding engagement therewith and transmit heat thereto, and a mounting for the block permitting it automatically to vary its position by tilting about a plurality of axes to maintain the block in engagement with the tool.

23. In a machine of the class described, in combination, a shoe-engaging tool movable to vary the position of its surfaces, a heated block to be held in sliding engagement with one surface thereof to transmit heat to the tool, and a mounting for the block allowing it automatically to vary its position both by bodily movement and independent tilting movement when the tool is moved to maintain the block in sliding surface engagement with the tool.

24. In a machine of the class described, in combination, an angularly movable reciprocable shoe-engaging tool, a heated block to transmit heat thereto, and a yielding mounting for the block permitting it to tilt automatically about a plurality of axes according to the position of the tool to maintain the block in sliding surface engagement therewith.

25. In a machine of the class described, in combination, a movable tool to engage a shoe, means to move the tool back and forth in rubbing engagement with the shoe, means to impart percussional impulses to the tool in a direction substantially perpendicular to the surface of the shoe, and a heating member held in sliding surface engagement with said tool.

26. In a machine of the class described, in combination, a movable tool, a rotary shaft, a connection from the shaft to impart short rapid vibrations to the tool to move it back and forth in rubbing engagement with a shoe, an auxiliary connection to impart percussional impulses to the tool in a direction substantially perpendicular to the surface of the shoe, and a heating member held in sliding surface engagement with said tool.

27. In a machine of the class described, in combination, a shoe-engaging tool, means to rub the tool against a shoe and simultaneously to pound it against the shoe, a heated block, and a mounting allowing the block a universal movement and holding it in surface sliding engagement with the tool to conduct heat thereto.

28. In a machine of the class described, in combination, an ironing tool to engage a shoe, a mechanically-operated lever to move the tool back and forth in rubbing engagement with a shoe, a cam to impart a series of percussional impulses to the tool during each back and forth movement, and a heating block held in sliding surface engagement with said tool and freely tiltable relatively thereto.

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

HARRY E. DOW.