March 20, 1951 A. C. BURLEIGH 2,546,087

PAD ELEMENT FOR ABRADING MACHINES

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Fig. 1.

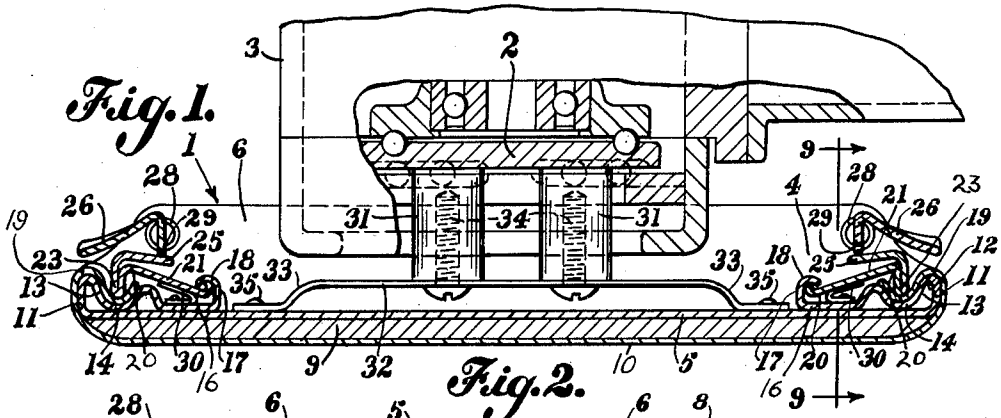


Fig. 2.

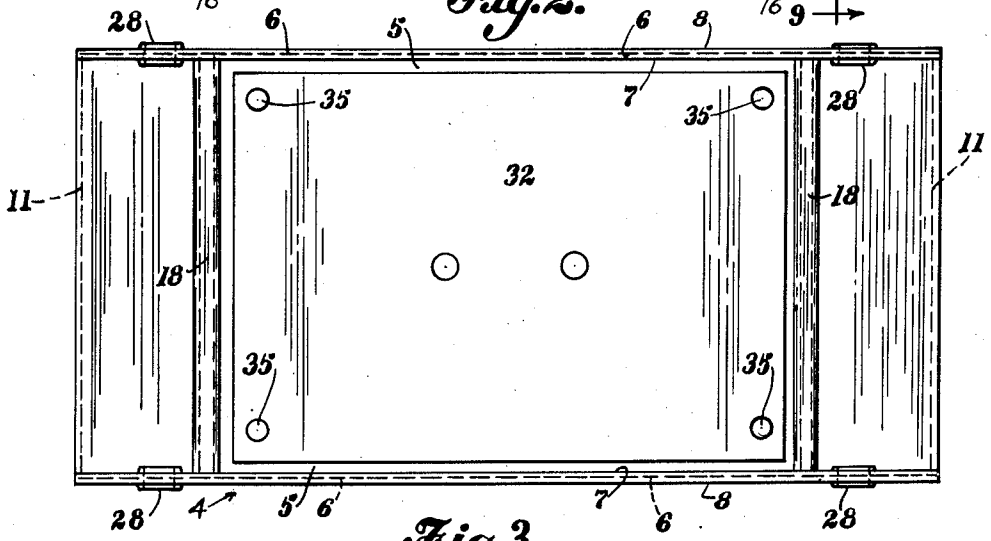


Fig. 3.

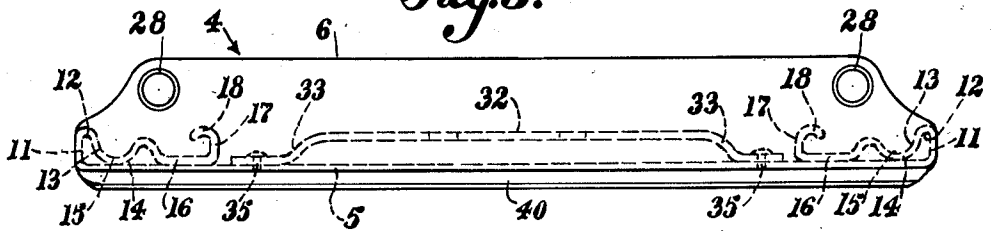
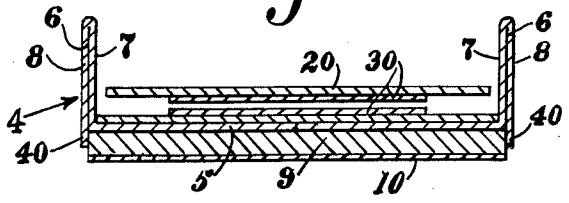


Fig. 9.



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PAD ELEMENT FOR ABRADING MACHINES

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Fig. 4.

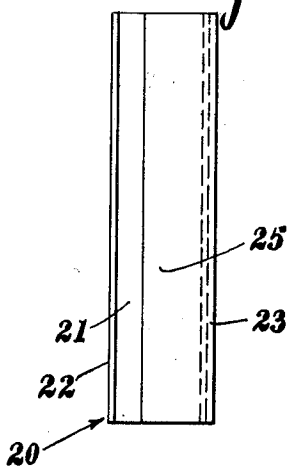


Fig. 6.

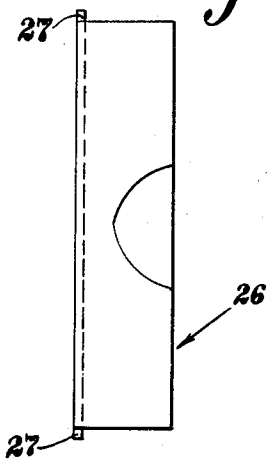


Fig. 5

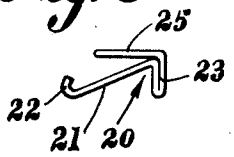


Fig. 7.

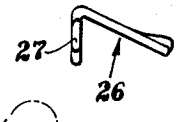
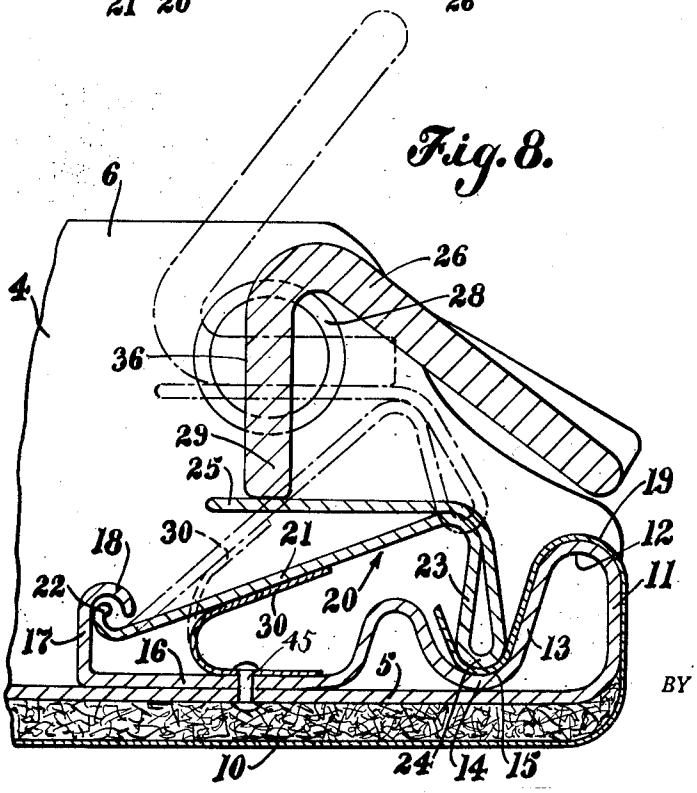


Fig. 8.



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UNITED STATES PATENT OFFICE

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PAD ELEMENT FOR ABRADING MACHINES

Arthur C. Burleigh, Wellesley, Mass.

Application April 11, 1949, Serial No. 86,751

6 Claims. (Cl. 51—189)

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This invention relates to portable abrading machines and particularly to the pad assembly of such a machine which carries the abrasive material and which, when the machine is in operation, has a rapid vibratory movement.

The abrasive element in machines of this type is usually in the form of sandpaper or emery cloth, and means are provided for removably clamping it in position on the operative surface of the pad assembly so that as the abrasive element loses its abrasive qualities, it may be removed and replaced by a fresh element.

An object of my present invention is to provide an improved and simple form of means for thus clamping the abrasive sheet to the operative face of the pad assembly.

In the drawings, wherein I have illustrated a selected embodiment of my invention,

Fig. 1 is a fragmentary sectional view showing a portion of the head of an abrading machine having my improved pad assembly mounted thereon.

Fig. 2 is a plan view of the body member of the pad assembly.

Fig. 3 is a side view of said body member with the clamps omitted.

Fig. 4 is a top plan view of the clamping member.

Fig. 5 is a side view thereof.

Fig. 6 is a top plan view of the clamp actuator.

Fig. 7 is a side view thereof.

Fig. 8 is an enlarged sectional view through one end of the pad member showing the manner in which the abrasive element is clamped to the body member.

Fig. 9 is a section on the line 9—9, Fig. 1.

Referring to Fig. 1, 1 indicates generally the pad assembly of a portable abrading machine which is shown as secured to a vibrating pad-carrying member 2 which is enclosed in the head 3 of the machine and which may be given its vibratory movement by any suitable or usual means such for instance as that illustrated in my co-pending application Serial No. 81,759, filed March 16, 1949, or in my Patent No. 2,276,534, dated March 17, 1942.

The pad assembly embodying my invention comprises a body member 4 which presents a flat bottom surface 5 and an upstanding side wall 6 at each side of the bottom face. The body member may be made of sheet material or it may be a die casting. If made of sheet metal or other sheet material, each side wall 6 may be formed by bending the sheet material upwardly as shown at 7 and then downwardly as shown at 8 thereby

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providing a two-ply wall. The bottom edges 40 of the downwardly bent portions 8 extend below the bottom face 5 as shown in Fig. 9 to provide pad-retaining lips. The bottom surface 5 of the body member has secured thereto a pad 9 of some yielding material such as rubber, and the pad assembly also embodies a sheet 10 of abrasive material such as sandpaper, which underlies the pad 9 and the ends of which are clamped to the ends of the body member 4. The pad 9 is confined between the lips 40 and is held thereby against sidewise movement.

One feature of my present invention relates to the manner in which the abrasive sheet 10 is thus clamped to the body member.

As herein illustrated each end of the body member 4 is bent upwardly as shown at 11 and then inwardly or backwardly as shown at 12 and downwardly as shown at 13, thereby forming at each end of the body member an inverted U-shaped portion which constitutes a rib member that extends transversely across the body member.

The downwardly bent section 13 merges into a rearwardly and upwardly bent section 14 which rests against the bottom 5 and the upper surface of which constitutes a concave clamping surface 15 extending in a generally horizontal direction.

The portion 14 merges into a rearwardly extending section 16 which lies flatly against the upper face of the bottom 5 and is secured thereto by a rivet 45. The end of the portion 16 is bent upwardly as at 17 and forwardly as at 18 to provide an anchoring hook portion for the clamping member presently to be described.

The U-shaped portion 11, 12, 13 and the clamping portion 14 as well as the portions 16, 17 and 18 extend clear across the body 4 from one side wall 6 to the other. Each end portion 19 of the abrasive sheet 10 is carried around the inverted U-shaped portion 11, 12 and 13 and is clamped against the clamping surface 15 by means of a clamping member 20. Said clamping member is formed with a body portion 21 which extends across the pad assembly from one side wall 6 to the other, the rear end 22 of the body 21 having a hook shape to interlock with the anchoring portion 18. The clamping member is preferably made of sheet material and it is bent to form a clamping foot portion 23 which extends at an angle from the body 21, said foot portion being formed by bending the sheet metal into a U-formation thereby providing the foot with a rounded clamping face 24. The material of the clamping member is extended backwardly from

the clamping foot as shown at 25, said backwardly extending portion being somewhat resilient.

Cooperating with the clamping member 20 is a clamp actuator 26 which extends from one side wall 6 to the other and is provided with two trunnions 27 which are journaled in openings or bearings 28 with which the side walls 6 are provided.

The clamp actuator 26 is made of sheet metal and is bent to provide the portion 29 which is shown as having an acute angle with the body of the actuator.

The clamping member 20 is acted upon by a suitable spring 30 which tends to move the clamping member upwardly into the dotted line position, Fig. 8 thereby opening the clamp. When the clamp actuator 26 is in its inoperative or dotted line position, the spring 30 will hold the clamp in a position with the portion 25 thereof resting against the flat face 36 of the part 29 of the clamp actuator.

With the parts in this position the sheet 10 of sandpaper or other abrasive material is applied to the bottom face of the pad and each end portion 19 is passed around the corresponding inverted U-shaped portion 11, 12, 13 and into the space between the raised clamping foot 23 of the clamping member and the clamping surface 15. With the parts in this position the swinging of the clamp actuator from the dotted to the full line position Fig. 8 will cause the part 29 of the clamp actuator to bear against the portion 25 of the clamp, thereby swinging said clamp downwardly into its operative clamping position as also shown in full lines in Fig. 8, the engagement of the hooked end 22 of the clamping member 20 with the anchoring hook 18 of the body member 4 serving as a pivotal connection for the clamping member during such swinging movement. During the closing movement of the clamping member the rounded end 24 of the clamping foot 23 will, by its engagement with the abrasive sheet. tend to draw the same tightly around the inverted U-shaped end 11, 12, 13 of the body, and when the clamp actuator is in its closed position shown in full lines in Fig. 8, the clamping foot 23 will clamp the end of the abrasive sheet firmly against the clamping face 15. The relation between the part 29 of the clamp actuator 26 and the resilient portion 25 of the clamping member 20 is such that the clamping foot 23 will be brought into clamping relation with the clamping face 15 before the clamp actuator has been carried into its closed position, and hence during the final portion of the closing movement of said clamp actuator the portion 25 of the clamping member will yield as necessary to allow the full closing movement of the clamp actuator.

The clamp actuator is so designed that when it is in its operative position shown in full lines Fig. 8, the pressure applying portion 29 thereof has been carried just beyond a dead center position and hence the upward pressure of the resilient portion 25 of the clamp against the clamp actuator will tend to hold it in its operative position. When the clamp actuator is raised into its inoperative position shown in dotted lines in Fig. 8, the spring 30 operates to raise the clamp 20 into its open position.

The pad assembly is secured to the pad-carrying member 2 through the medium of two posts 31, and there is provided herein a connection between the posts and the pad assembly by which the pressure to which the pad is subjected during the abrading operation will be evenly distributed over the pad.

As herein shown an arched sheet metal attaching member 32 is secured to the posts 31 by means of screws 34, and the downwardly bent ends 33 of said attaching member are secured to the base plate 5, as by means of rivets 35.

With this arrangement the pressure which is applied to the head 3 during the abrading operation is transmitted to the body member at the ends of the attaching member 32 and thereby the entire active abrasive surface of the pad will be subjected to substantially the same pressure. Furthermore this construction is helpful in maintaining the flat condition of the active face of the pad.

While I have herein described the invention as embodied in an abrading machine, yet it is obvious that the clamping member herein disclosed is equally applicable for use with portable rubbing or polishing machines for clamping in position the rubbing or polishing sheet or surface that is attached to the bottom of the pad.

I claim:

1. A pad assembly for an abrading machine comprising a body member of sheet material having each end bent upwardly then backwardly and downwardly to form an inverted U-shaped portion and then bent backwardly and upwardly to provide a concave clamping surface, a pad member secured to the bottom of the body member, an abrasive sheet underlying the pad member and having its ends bent around said U-shaped portions and overlying said clamping surfaces, a clamping member pivotally connected to the body member at each end thereof and having a clamping foot and two pivotally mounted clamp actuators, one for each clamping member, to apply thereto and to the clamping foot, a clamping pressure for clamping the end portion of said sheet against the clamping surface.

2. A pad assembly for an abrading machine comprising a body member of sheet material having its ends bent upwardly then backwardly and downwardly to form an inverted U-shaped portion and then bent backwardly and upwardly to provide a concave clamping surface, a pad member secured to the bottom of the body member, an abrasive sheet underlying the pad member and having its ends bent around said U-shaped portions and overlying said clamping surfaces, a clamping member pivotally connected to the body member at each end thereof and having a clamping foot for clamping the end of said sheet against the corresponding clamping surface, said clamping member also having a resilient arm, and a clamp actuator for applying a clamping pressure to said arm and thereby to said clamping foot.

3. A pad assembly for an abrading machine comprising a body member having at each end a transversely extending rib member and a clamping surface immediately inside of each rib, a pad member secured to the bottom of the body member, an abrasive sheet underlying the pad member and having its ends bent around said ribs and overlying said clamping surfaces, a clamping member at each end of the base member and having pivotal connection therewith and also provided with a clamping foot extending from one side to the other of the base member, each clamping member having a resilient arm, and a pivotally mounted clamp actuating member cooperating resilient arm of each clamping member for

closing the clamping foot thereof on to the end of the abrasive sheet with a yielding pressure and clamping it against the said clamping surface.

4. A pad assembly for an abrading machine comprising a body member of sheet material having each end bent upwardly then backwardly and downwardly to form a transversely extending rib and then bent backwardly and upwardly to provide a concave clamping surface, a pad member secured to the bottom of the body member, an abrasive sheet underlying the pad member and having its ends bent around said ribs and overlying the clamping surfaces, said body member having at each end an anchoring hook portion, a clamping member at each end of the body member, each clamping member having at one end thereof a clamping foot to cooperate with the corresponding clamping surface and at the other end a hook portion cooperating with the corresponding anchoring hook portion to provide a pivotal mounting for the clamping member, and a pivotally mounted clamp-actuating member for each clamping member by which the latter is actuated to apply a clamping pressure against the portion of the abrasive sheet overlying the corresponding clamping surface.

5. A pad assembly for an abrading machine comprising a body member of sheet material having each end bent upwardly then backwardly and downwardly to form a transversely extending rib and then bent backwardly and upwardly to provide a concave clamping surface, a pad member secured to the bottom of the body member, an abrasive sheet underlying the pad member and having its ends bent around said ribs and overlying said clamping surfaces, said body member having at each end a downwardly facing anchoring hook portion, a clamping member at each end of the body member, each clamping member having at one end a clamping foot to cooperate with the corresponding clamping surface and at the other end a hook portion cooperating with the corresponding downwardly facing anchoring hook to provide a pivotal

mounting for the clamping member, each clamping member also having a resilient arm, and a pivotally mounted clamp-actuating member for engaging the resilient arm of each clamping member and operative to clamp its clamping foot yieldingly against the portion of the abrasive sheet overlying the corresponding clamping surface.

6. A pad assembly for an abrading machine comprising a body member of sheet metal presenting a flat bottom face and an upstanding wall at each side, said body member having at each end a transversely extending rib and a horizontally extending clamping surface immediately inside of each rib, a pad secured to the bottom face of the body member, an abrasive sheet underlying said pad and having its ends folded around the ribs and overlying the clamping surfaces, a swinging clamping member at each end of the body member, each clamping member having a clamping foot, a clamp-actuating member for each clamping member, each clamp-actuating member being pivotally mounted in the upstanding walls and operative by its turning movement to apply to the corresponding clamping member and thereby to its clamping foot a clamping pressure for clamping the end portion of the abrasive sheet against the corresponding clamping surface.

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