WORKING HEAD OF A SANDING MACHINE AND SUPPORT THEREFOR

Filed April 13, 1962

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The present invention relates to a working head for a sanding machine and to a rocking assembly therefor.

The sanding machines as presently used today have either a flat working surface, vertical or horizontal, of a substantial extent or are provided with a working surface which consists of a relatively small diameter vertical roller onto which is applied a strip or sleeve.

In the case where a substantial horizontal or vertical working surface is provided, this surface will not provide for the working of an accurate concave area. In such a case, a machine having a vertical roller onto which a sanding sleeve or strip is applied is used but, due to the limited surface offered by such a roller, it is not possible to obtain satisfactory results where the radius of curvature of the piece to be worked is somewhat large. Rollers having a considerable diameter would have to be used, which rollers are completely impractical.

It is therefore a main object of the invention to provide a working head for a sanding machine that makes it possible to work all types of curved surfaces, particularly concave surfaces having a large radius of curvature.

Yet another object of the invention consists in providing a working head for a sanding machine which is so made that it will automatically rid itself of a substantial amount of the particles of the material being worked, which are caught between the grains of the abrasive sleeves or strips.

A further object of the invention resides in the provision of an assembly for the rocking head of a machine especially adapted for the working of pieces of all sizes without the possibility of causing injury to the user.

The above mentioned objects may be obtained in a working head for a sanding machine according to the invention which comprises: a support having an elongated belt guiding member along a forward sanding edge thereof and generally at an apex of said triangular structure; means mounting said support and belt guiding member on said base structure with the guiding member cutting the plane of said working supporting surface and rotatable about axes parallel to the longitudinal axis of said belt guiding member; one of said rollers being a driving roller, the other a driven roller; driving means for said driving roller, and an endless abrasive belt trained around said rollers and said forward guiding member whereby said belt may travel in a substantially triangular path normal to said roller and guiding member axes.

It is within the scope of the invention to provide the rocking assembly with a downwardly projecting actuating member cooperating with a rotatable but axially non-displaceable threaded element mounted below the table and parallel to the lateral walls. Lest motion means couples the actuating member and the threaded element to cause rocking of the assembly as the said threaded element is rotated. Such lost motion means preferably consists of a directing member having a threaded bore mounted on the threaded element and a normally vertical fork-like member having spaced legs. It also includes a projecting lug on the actuating member; the said lug being guidingly received between the spaced legs.

It is believed that a better understanding of the invention will be had by the following description of a specific but non-limitative embodiment thereof. This description having reference to the appended drawings wherein:

FIGURE 1 is a perspective view of the invention; FIGURE 2 is an exploded view of the support of the invention; FIGURE 3 shows a cross-sectional view of the support according to the invention and, FIGURE 4 is a partial cross-section of a guiding reel, as taken along line 4-4 of FIGURE 2.

The machine, on which the working head of the invention is used, comprises a horizontal working table supported by a generally rectangular body 3. The working head 5 of the machine projects above the working table 1 through an aperture 7 and comprises a working surface 9. It should be understood that the aperture 7 may actually be reduced to an edge 11 merely surrounding the working surface 9.

In the illustration used, the working head of the sanding machine comprises a driving reel 13, an idler reel 15 and a stationary front part 17. An endless sheet of abrasive paper 19 is set around the three parts 13, 15 and 17 and driven into rotation by driving reel 13. These components are part of the driving mechanism 21. As will be appreciated, the pieces to be worked are laid flat on working table 1 and pressed against the working surface 9 while the abrasive paper band 19 is rotating.

The various components of the driving mechanism and rocking assembly are illustrated on FIGURE 2, particularly.

The driving mechanism consists, as aforesaid, of reels 13 and 15 which are mounted on vertical shafts 23 and 25 respectively. Shaft 23 has one end thereof joined as by means of coupling 27 to a motor 29. These components are mounted on a normally vertical central support 31 having supporting brackets 33, 35, 35', 37 and 37', all integral with plate 31 or fixedly secured thereto. Bracket 33 lies on one side of support 31 at about the mid-portio thereof and brackets 35, 35' are located opposite the bracket 33. Brackets 37 and 37' stand in the upper part of the support 31. Finally, a removable bracket 39 is provided which lies across brackets 37, 37' and above bracket 33.

Brackets 35, 35' as well as 37, 37' are spaced from one another for the reception of guiding blocks 41, 41', each of which is provided, on each side, with guideways or grooves 43 in which the opposing edges of brackets 35, 35' and 37, 37' are received. The lower arrangement of brackets 35, 35' and guiding block 41 is further provided with a retaining member 45 in the form of a plate bridging the gap between the brackets 35, 35' and secured thereto by such means as screw 47. An adjusting screw 49 threads through retaining plate 45 and has the outer end freely received in a hole 51 in guiding blocks 41. Finally, a spring 53 tends to drive block 41, and thus idler reel 15, away from support 31. Adjustment may be made by means of the adjusting screw 49 so as to relieve or increase the pressure on the endless sand paper band 19. Similar changes in pressure may be obtained by the threaded hand operated rod 50 received in threaded hole 52 and bearing against the upper end of shaft 25.

The mounting of driving reel 13 is simply obtained by extending shaft 23 through bearings 55, 55' on brackets 33 and 39. For that purpose, bracket 39 has been made removable and may be connected to the support 31 by means of screws 57. As aforesaid, shaft 23 is connected to motor 29 through the coupling 27. The motor itself is secured to the support 31 through connecting bracket 59 and suitable screws or other fixing elements.

A notch 61 is cut off the frontal edge of plate 31 for the reception of the slightly arcuate frontal part 17.
which is secured thereto by means of screws 63. The depth of notch 61 is such that the frontal face of part 17 will lie flush with the frontal edge 65 of support 31. Finally, a graphite covered sheet 67 is glued or otherwise secured to the frontal part 17.

With the arrangement above described and with the particular shape of reeles 13 and 15 as further described in relation to FIGURE 4, the abrasive sleeve or belt 19 can be put on the head of the machine while the latter is rotating, simply by tilting the idler reel slightly towards the support 31, slipping the abrasive band on and gradually straightening the idler reel by means of the screw and handle 50. Similarly, whenever it is desired to remove the sleeve or belt it is simply necessary to again tilt idler reel 15 towards supporting plate 31 while the machine is operating.

The rocking mechanism is composed of a central portion 69 transversely connected to supporting plate 31 by means of screws 71. The mechanism also comprises side portions 73 either connected to the lateral walls 75 of body 3 or to the under surface of working table 1, as shown in dotted lines in FIGURE 2.

The outer lateral faces 77 of portion 69 are shown provided with segmental circular grooves 79 while the lateral faces 81 of side portions 73 are provided with mating segmental circular projections 83. It will be understood that, in assembled position of the supporting device, the circular projections ride in the circular grooves 79. Also, the position of the grooves and projections are interchangeable.

An important feature of the invention is that the centers of the grooves or projections lie in the plane of the center of the working machine. Also, the axis of rotation or of rocking of the central portion 69 and the supporting assembly preferably lies in the plane of the working surface. Also, good results are obtained when this rotation or rocking axis lies between the working surface 9 and the edge 11 of the working table.

Rocking of support 31 and of the rocking assembly may be obtained by means of a threaded rod 87 mounted parallel to lateral walls 75 and between the further lateral walls 85. Threaded rod 87 is rotatable but is non-displaceable axially. A director member 69 has a threaded bore mounted on the threaded rod 87 and is further provided with a normally vertical fork-like member 91 having spaced parallel legs. A lug, which in this case may be a bolt or screw 93, is secured to support 31 to extend loosely between the legs of the fork member 91. Finally, a handle 95 is used for rotating threaded rod 87. As will be appreciated, the rotation of handle 95 and rod 87 will displace the director member 99 along rod 87 and cause rocking of support 31 while lug 93 rides the fork 91. The extreme positions of such displacements are shown in dotted lines in FIGURE 3.

With an arrangement such as above described, and as best illustrated in FIGURE 3, it will be understood that rocking action of the working head will not change the width of the space between the edge 11 of the working table and the working surface 9 of the working head. In the illustration of FIGURE 4, the driving reel 13 is shown provided, on the active face thereof, with a rubber covering 97 in order to provide a better frictional and gripping action on the sand paper band 19. It should also be observed that the outer wall 93 is somewhat barrel-shaped, as is also the case with the idler reel 15. The purpose of this particular shape is to prevent the sand paper band 19 from sliding off the reel.

Although specific embodiment of the invention has just been described, it will be understood that various modifications may be made thereto without departing from the spirit of the invention or from its scope as set forth in the appended claims.

I claim:

1. In a sanding machine having a base structure including a working head structure therefor comprising:
   (a) a support having an elongated belt guiding member along a forward sanding edge thereof and generally at an apex of said triangular structure;
   (b) means mounting said support and said belt guiding member on said base structure with the longitudinal axis of the guiding member cutting the plane of said work supporting surface;
   (c) a belt driving roller mounted on one side of said support, rearwardly thereof, for rotation about an axis parallel to the V-shaped axis of said belt guiding member; said roller being mounted generally at another apex of said triangular structure;
   (d) driving means on said support for rotating said driving roller;
   (e) a driven roller mounted on the opposite side of said central support, rearwardly thereof, for rotation about an axis parallel to the V-shaped axis of said belt guiding member whereby said belt may travel in a substantially triangular path normal to said roller and guiding member axes;
   (f) means shifting said driven roller angularly in relation to said support to force vertical movement of said belt to cause engagement and disengagement thereof from said head.

2. In a sanding machine having a base structure including a working support surface, a generally triangular working head structure therefor comprising:
   (a) a support having an elongated belt guiding member along a forward sanding edge thereof and generally at an apex of said triangular structure;
   (b) means pivotally mounting said support and belt guiding member on said base structure with the longitudinal axis of the guiding member cutting the plane of said work supporting surface; said pivotal means allowing rocking movement in a path substantially normal to said working supporting surface;
   (c) a belt driving roller on one side of said support, rearwardly thereof, for rotation about an axis parallel to the longitudinal axis of said belt guiding member; said roller being mounted generally at another apex of said triangular structure;
   (d) driving means, on said support, for rotating said driving roller;
   (e) upper and lower bearing means projecting laterally from said support, rearwardly thereof;
   (f) a driven roller mounted on and between said upper and lower bearing means and generally at the third apex of said triangular structure;
   (g) an endless abrasive belt trained around said roller and said forward guiding member whereby said belt may travel in a substantially triangular path normal to said path of rocking movement;
   (h) said upper bearing means including a bearing block and means moving said block to and from said support whereby to angularly shift said driven roller in relation to said support to force vertical movement of said belt to cause engagement and disengagement thereof from said head.

3. A working head structure as claimed in claim 2, wherein said lower bearing means includes a bearing block resiliently pressed outwardly in relation to said support and means to adjust the lateral position of said block in relation to the support whereby lateral bodily displacement of said driven roller may be obtained by control of said upper and lower bearing means.

4. In a sanding machine having a base structure including a working support surface, a generally triangular working head structure therefor comprising:
   (a) a central support having an elongated belt guiding
member along a forward sanding edge thereof and generally at an apex of said triangular structure;

(b) a rocking plate connected transversely of and on the forward edge of said central support to extend on both sides thereof with the support projecting above said work supporting surface;

c) means pivotally connecting said plate along the upper edge thereof to said base structure, whereby said support may rock in a path normal to said work supporting surface;

(d) a rotatable threaded rod mounted on said base structure parallel to said central support;

(e) a threaded directing member displaceable on said rod as the latter rotates;

(f) lost motion means on said member and central support whereby said support may be rocked as said threaded rod rotates;

(g) a belt driving roller on one side of said central support, rearwardly thereof and extending above said work supporting surface, for rotation about an axis parallel to the longitudinal axis of said belt guiding member; said roller being mounted generally at another apex of said triangular structure;

(h) driving means on said support, for rotating said driving roller;

(i) upper and lower bearing means projecting laterally from said central support, rearwardly thereof;

(j) a driven roller mounted on and between said upper and lower bearing means and generally at the third apex of said triangular structure;

(k) an endless abrasive belt trained around said rollers and said forward guiding member whereby said belt may travel in a substantially triangular path normal to said path of rocking movement;

(l) said upper bearing means including a bearing block


5 and means moving said block to and from said central support whereby to angularly shift said driven roller in relation to said support to force vertical movement of said belt to cause engagement and disengagement thereof from said head.

5. A working head structure as claimed in claim 4, wherein said lower bearing means includes a bearing block resiliently pressed outwardly in relation to said central support and means to adjust the lateral position of said block in relation to the support whereby lateral bodily displacement of said driven roller may be obtained by control of said upper and lower bearing means.

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