

Sept. 22, 1970

F. M. OWREY
SANDING MACHINE

3,529,384

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2 Sheets-Sheet 1

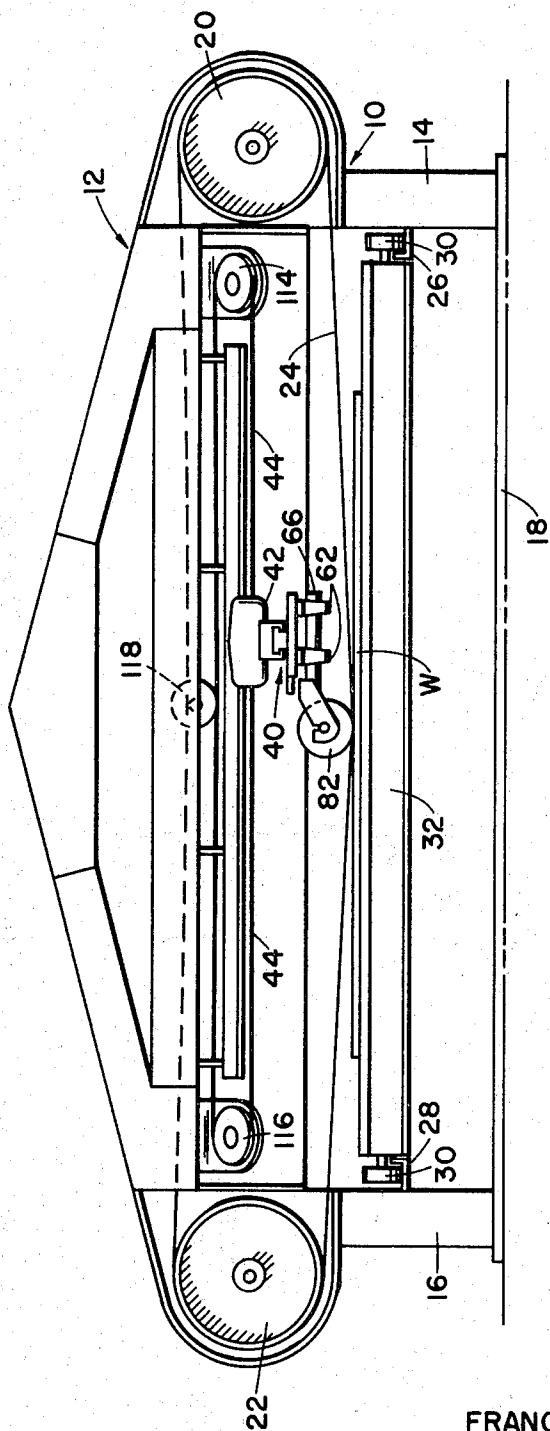


FIG. 1

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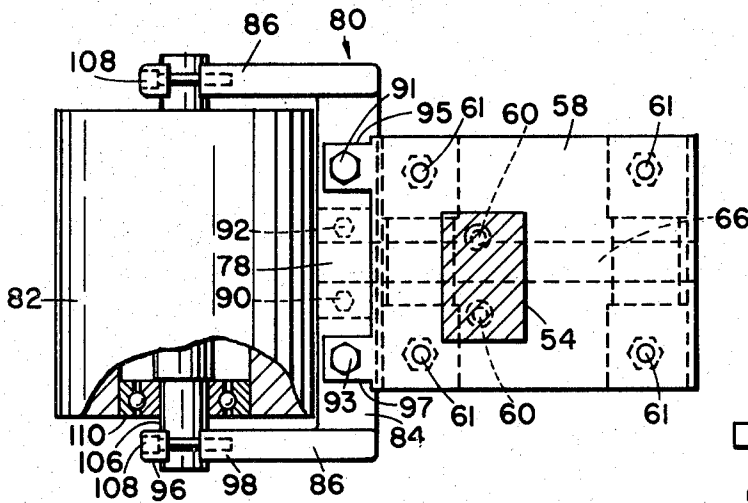


FIG. 3

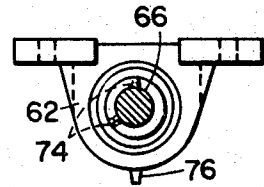


FIG. 4

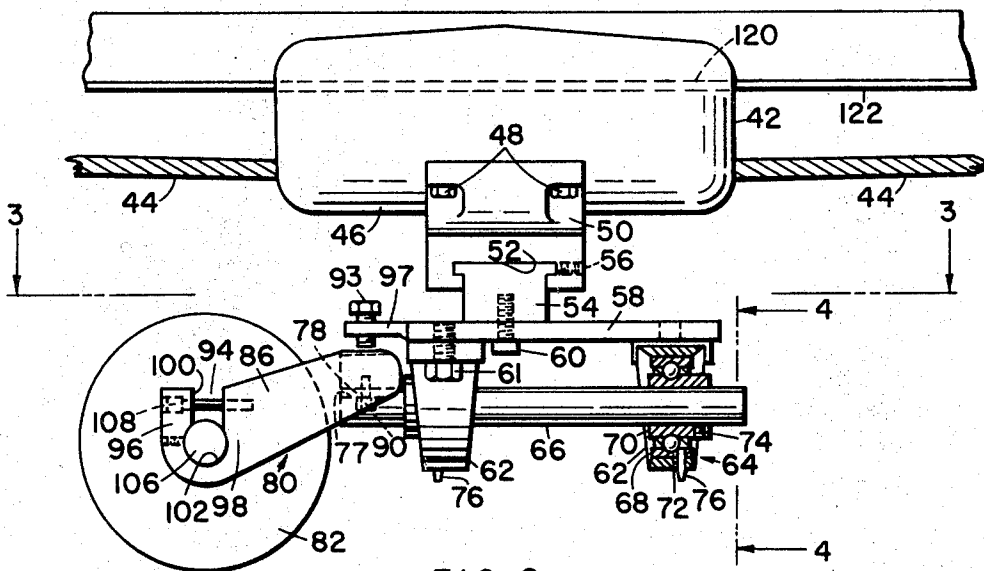


FIG. 2

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3,529,384

SANDING MACHINE

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2 Claims

ABSTRACT OF THE DISCLOSURE

A stroke sanding machine having a contact roll reciprocable along the length of the active run of an abrasive belt for urging the same against a workpiece. The contact roll is mounted between the arms of a yoke member, the bight portion of the yoke member being connected to a shaft mounted in spaced bearings for free rotation about an axis perpendicular to a vertical plane cut through the axis of rotation of the contact roll.

BACKGROUND OF THE INVENTION

This invention relates to stroke sanding machines and, more particularly, to a contact roll for urging an abrasive belt against a workpiece.

In the field of finishing surfaces by sanding the same, it has been known to employ automatic stroke sanders having traveling contact pads for engaging an abrasive belt, and while moving back and forth therealong, applying pressure thereto for effecting the sanding operation. Another known expedient is to use a contact roll that rolls back and forth along the abrasive belt to apply the necessary grinding pressure for obtaining a good finish.

SUMMARY

Although such prior known devices have served the purpose for which they were designed, they have not been entirely satisfactory under all conditions of operation due to their contacting surfaces being substantially fixed relative to the abrasive belt, resulting in streaks in the workpiece caused by unequal forces across the contacting surface of the pad or roll. These unequal forces are caused by the nonuniformity of thickness of the workpiece and the problem of adequately supporting the pad or roll to accommodate such irregularities in the thickness of the workpiece has seriously limited their efficiency.

The general purpose of the present invention is to obviate the above deficiencies by providing a contact roll mounted for free rotation about an axis perpendicular to a vertical plane cut along the axis of rotation of the contact roll.

It is therefore an object of the present invention to provide a new and improved stroke sanding machine.

It is another object of the present invention to provide a new and improved stroke sanding machine having a novel contact roll.

It is a further object of the present invention to provide a new and improved stroke sanding machine having a novel contact roll mounted for free or floating rotation.

These and other objects of the present invention will become more apparent upon consideration of the following detailed description thereof when taken in conjunction with the following drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevation view of a sanding machine in which a preferred illustrative embodiment of the invention is incorporated;

FIG. 2 is an enlarged view of the contact roll traveling head with one of the bearing blocks shown in section;

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FIG. 3 is a plan view, partially in section, taken on the plane of line 3—3 of FIG. 2; and

FIG. 4 is a vertical section taken on the plane of line 4—4 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings and particularly to FIG. 1, it will be observed that a preferred embodiment of the invention constructed in accordance with the principles of this invention is incorporated in an automatic stroke sanding machine, generally designated 10, which comprises a suitable elongated horizontal frame, generally designated 12, suitably supported by a plurality of vertically extending pedestals, only two being shown in FIG. 1 and being designated 14 and 16, said pedestals being mounted on a base 18. Journaled for rotation in suitable bearings on frame 12 are a pair of abrasive belt pulleys 20 and 22, either of which may be driven, and around which an endless abrasive belt 24 is trained for movement in an orbital path. The means for driving and rotating either of the pulleys may be of any conventional variety, and since many such drive arrangements are well-known in the art, no illustration or further amplification is believed necessary.

A pair of elongated guide rails 26 and 28 rigidly secured to pedestals 14 and 16, respectively, and extending horizontally in a direction substantially normal thereto, are provided for receiving a plurality of rollers 30 suitably journaled for rotation in suitable bearings at the opposite ends of a worktable 32. The worktable 32 supports the work W and is reciprocated, either manually or by automatically controlled means, as desired, in a horizontal direction substantially perpendicular to the path of movement of abrasive belt 24. It should be appreciated that the principles of this invention contemplate the use of an endless conveyor belt in lieu of the reciprocating worktable, if desired. Conversely, the worktable may be maintained stationary and frame 12 provided with rollers to ride on guide rails mounted either on the pedestals or on a ground surface, if desired, within the purview of the present invention.

A contact roll traveling head, generally designated 40, is provided for pressing the abrasive belt 24 against the surface of the workpiece W. With reference to FIGS. 2 and 3, the traveling head 40 comprises an elongated slide member 42 having a cable rope 44 secured to its opposite ends for a purpose hereinafter more fully explained. Depending from the arcuately curved bottom portion 46 of slide member 42, and rigidly secured thereto as by means of bolts 48, is a bracket 50. The lower portion of bracket 50 has a dovetail slot 52 in which is slidably mounted a member 54 for adjustment in directions laterally of slide member 42. Set screws 56, only one of which is shown in FIG. 2, are provided for retaining member 54 in its adjusted position.

Suitably rigidly secured to the bottom of member 54 by any suitable means, such as screws 60, is a flat plate 58. Depending from plate 58 and secured thereto by screws 61 are a pair of bearing blocks 62 for housing bearings, generally designated 64, which permit free rotation of shaft 66.

Bearing 64 comprises an outer stationary race 68 and an inner rotatable race 70 having a complement of balls 72 annularly disposed therebetween. Inner race 70 is provided with set screws 74 for securing shaft 66 thereto. A suitable grease fitting 76 is provided in block 62 for admitting a suitable lubricant to bearing 64.

The forward end of shaft 66 is provided with a flat portion 76 on its upper side, the forward end taken to be the left hand side of the shaft as seen in FIG. 2. An elongated flat plate 78 is rigidly secured onto the flat

portion 76 of shaft 66 and extends horizontally in a direction normal to the longitudinal axis of shaft 66.

A yoke member, generally designated 80, is provided for supporting a contact roll 82, said yoke member comprising a substantially flat elongated bight portion 84 and a pair of arms 86 extending generally forwardly from the opposite ends of bight portion 84. Said bight portion 84 of yoke member 80 is disposed above plate 78 intermediate its ends and secured thereto by any suitable means, such as bolts 90 and 92. Thus, it will be seen that yoke member 80 is rigidly mounted to shaft 66 and rotatable therewith about the longitudinal axis of shaft 66. Adjustable stop screws 91 and 93 are provided on spaced lugs 95 and 97, respectively, extending forwardly of plate 58 in order to limit the amount of rotational movement of yoke member 80.

With reference to FIG. 2, it will be seen that each of the arms 86 is provided with a slot 94 adjacent its free end, said slot defining bifurcations 96 and 98 and having a portion 100 rectangular in shape and terminating in a circular portion 102 for receiving the end portion of a shaft 106. The end portions of shaft 106 are suitably rigidly fixed in the circular portions 102 of arms 86 by means of suitable bolts 108 for adjusting the clamping pressure of bifurcations 96 and 98. Contact roll 82 is journaled for rotation on bearings 110 (only one of which is shown in FIG. 3) suitably secured onto shaft 106.

As hereinbefore mentioned, slide 42 is secured at either end to cable rope 44 which is trained about pulleys 114 and 116 suitably secured on frame 12 at either end thereof. The cable rope is wrapped about a winding drum 118 suitably driven or rotated alternatively in the clockwise and counterclockwise directions by means of a hydraulic motor, not shown, but well-known in the art. The slide is suitably slotted as at 120 to ride on a guide bar 122 in its reciprocating movement.

In operation, a workpiece W is deposited on the worktable 32, said worktable being reciprocated back and forth beneath abrasive belt 24 in a direction transverse to the active run of said abrasive belt. The endless abrasive belt is caused to move continuously in one direction slightly above the workpiece W. Simultaneously, slide 42 is actuated by means of cable rope 44, winding drum 118 and the hydraulic motor. The contact roll 82 is reciprocated along the length of the active run of abrasive belt 24 for a distance generally commensurate with the length of the workpiece for urging said belt into contact with the surface of the workpiece. The length of the stroke may be adjusted, as desired, dependent on the workpiece size, and since such adjusting means form no part of the invention, no further amplification is believed neces-

sary. In the event an endless conveyor is utilized in lieu of worktable 32, the workpieces may be continuously advanced beneath abrasive belt 24 and the contact roll actuated during workpiece advancement.

As a result of this invention, an improved sanding machine is provided for finishing the surfaces of workpieces in an improved and more efficient manner.

By mounting the contact roll on a yoke having a shaft mounted in spaced bearings for free rotation, the contact roll "floats" over the abrasive belt, thus equalizing the grinding or sanding forces across the width of the contact roll and accordingly, applying equal forces to the workpiece. The advantage residing in this feature is that streaking of finished surfaces is minimized, and in some cases eliminated. However, the abrasive belt wears evenly across its width thereby extending the useful life of such belt.

A preferred embodiment of the principles of this invention having been hereinbefore described and illustrated, it is to be realized that modifications thereof can be made without departing from the broad spirit and scope of this invention as defined in the appended claims.

I claim:

1. An apparatus for urging an abrasive belt against a workpiece comprising; a contact roll engageable with said abrasive belt and having an axis of rotation; a yoke member having a bight portion and a pair of spaced arms extending therefrom having free end portions, respectively, said contact roll being mounted for rotation between said spaced arms adjacent said free end portions, and said bight portion of said yoke member being rigidly secured to an elongated shaft mounted for free rotation in spaced bearings about an axis normal to a vertical plane including the axis of rotation of said contact roll; a slide; means mounting said bearings on said slide, said mounting means comprising a bracket dependent from said slide and having a dovetail slot therein; and a member having a complementary dovetail and adjustably slideable relative to said bracket.

2. An apparatus as defined in claim 1 including a plate secured to said last-mentioned member and having means for securing said bearings thereto.

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