Aug. 10, 1937. W. F. OCENASEK 2,089,808

SANDING MACHINE

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FIG. 4

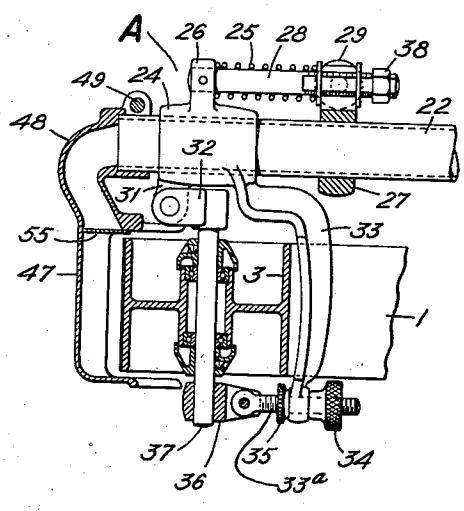


FIG. 1

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FIG. 2

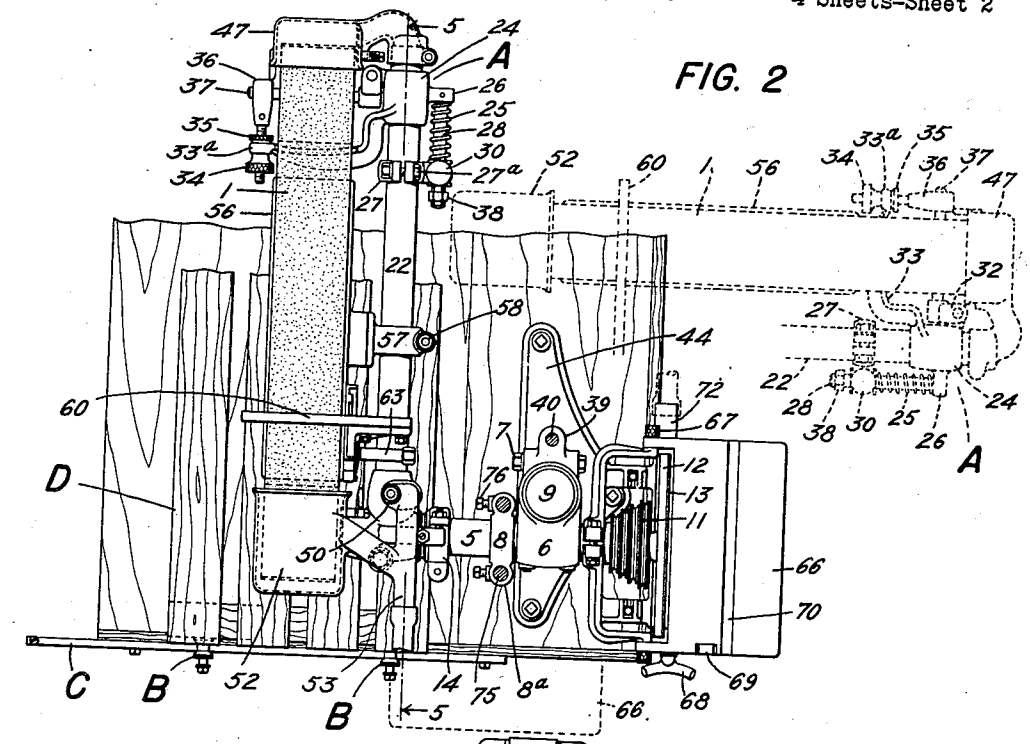
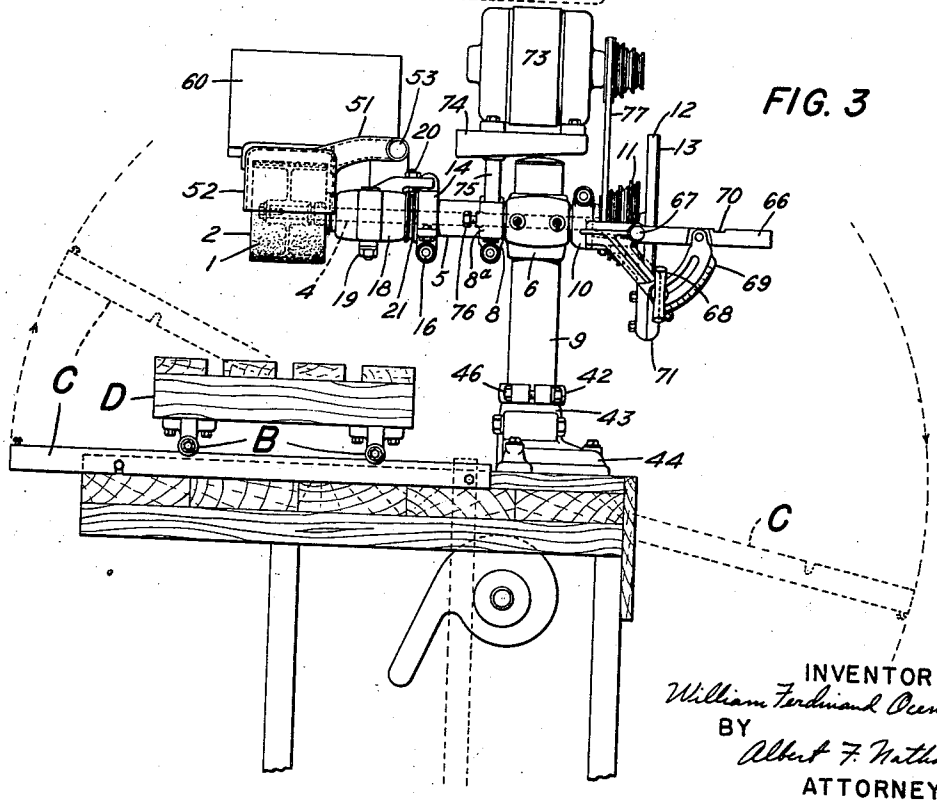


FIG. 3



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SANDING MACHINE

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FIG. 5

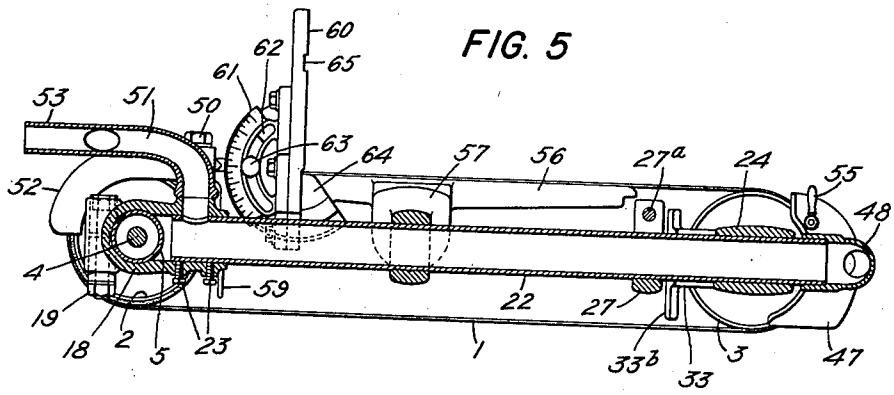
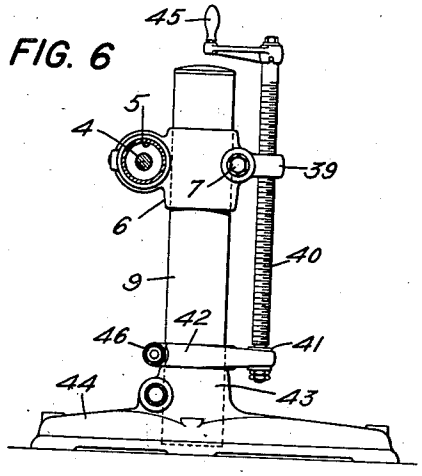


FIG. 6



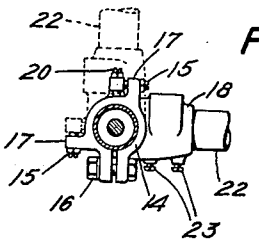


FIG. 7

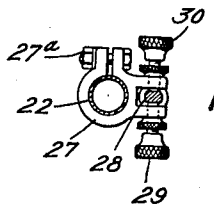


FIG. 8

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SANDING MACHINE

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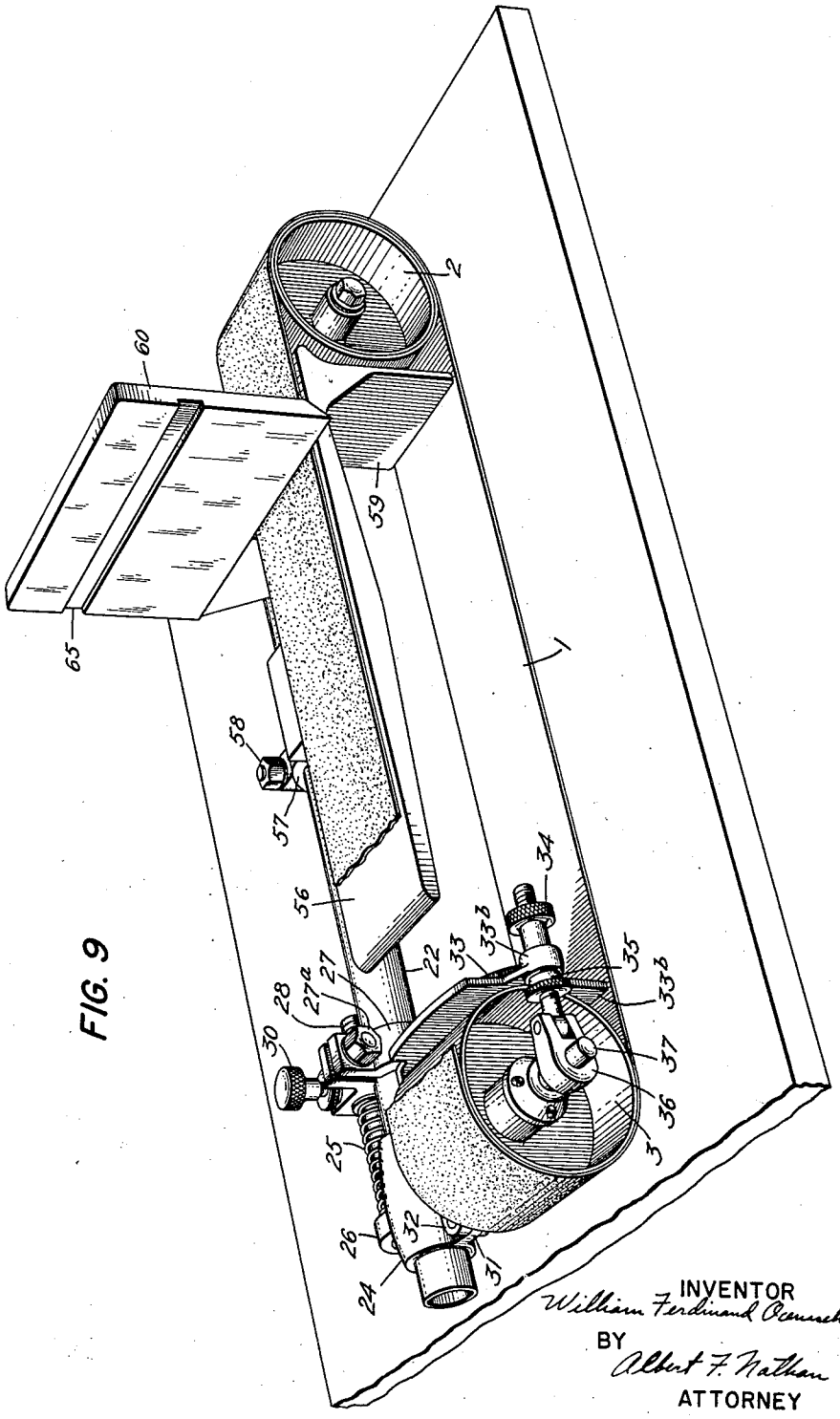


FIG. 9

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Patented Aug. 10, 1937 2,089,808

UNITED STATES PATENT OFFICE

2,089,808

SANDING MACHINE

William Ferdinand Ocenasek, Plainfield, N. J., assignor to Walker-Turner Company, Inc., Plainfield, N. J., a corporation of New York

Application August 7, 1936, Serial No. 94,782

10 Claims. (Cl. 51—143)

This invention proposes improvements in machines for performing the various sanding operations required in surfacing articles of manufacture.

The aim of this invention is to provide an unitary machine which, while fundamentally simple in design and hence capable of being built at moderate cost, will nevertheless enable its user to accomplish disc and belt sanding of the various sorts demanded by the nature and dimensions of the project being finished. For example, a board presenting a flat surface of considerable area is most conveniently surfaced by a so-called block-sanding operation; the board resting on a bench underneath a horizontal sand-belt which is depressed into contact by a migratory hand-block. Smaller and more easily handled pieces are best sanded by pressing them against a sand belt backed by a flat support; the belt sometimes running horizontally and sometimes vertically, depending upon the nature of the workpiece. In other cases, drum-sanding is needed for curved portions, while, on the other hand, the ends of a board can be best sanded across the grain by means of a disc-sander.

In general, the machine comprises a column rising from a bench or base, and a self-contained motor-driven organization so carried by said column that it may, as a unit, be vertically shifted on said column and also swung horizontally about said column. The vertical shift enables objects of various heights to be intervened between the lower run of the belt and the bench to accommodate the machine for sanding a wide range of bulky or extensive objects. The horizontal swing enables the user to bring the sanding disc or the belt sander into an accessible position. The importance of this is that the machine may be mounted on a bench near a wall and yet permit all its operations to be performed with complete convenience.

The belt-sanding portion of the motor-driven organization is, in turn, arranged in off-set location to the foot of the column to accommodate objects of considerable width on the bench without interfering with the foot of the column. Furthermore, this belt-sanding element is so designed that ample clear space is provided between the upper and lower runs of the belt for the reception of, and to afford a wide range of movement of, the hand-block employed for table sanding. A thin shelf extends into the said space to provide a backing for the upper run of the sand-belt. The belt-sanding element in turn may be swung in a vertical plane about the horizontal axis of its driving roller to enable the user to operate on either the type of work that can best be handled by a belt running vertically or horizontally, or at intermediate angles, as the case may be.

How these and other desiderata are achieved, and the adaptability of this machine for its diversity of operations together with its characteristics of construction will be explained in connection with the drawings which illustrate a preferred embodiment of the invention. In such drawings:—

Fig. 1 is a side elevation of the machine showing how it may be mounted on a bench provided with a shiftable carriage for supporting boards or objects of considerable size. The sand-belt is shown running horizontally to be available either for sanding objects resting on the upper run of the belt or for block or trowel sanding.

Fig. 2 is a plan, and Fig. 3 an end elevation of the machine.

Fig. 4 is a cross-sectional detail showing the means for adjusting the alignment of the idler for the sand-belt and likewise showing details of the dust-collecting feature.

Fig. 5 is a cross-sectional detail along the line 5—5 of Fig. 2 showing further details of the dust-collecting feature and of the mounting of the various parts.

Fig. 6 is a detail of the post and the means for elevating the unit carried thereby.

Fig. 7 is a detail of the mounting of the sand-belt unit whereby it may be swung in a vertical plane.

Fig. 8 is a detail of the adjusting screws for aligning the idler to secure proper tracking of the belt.

Fig. 9 is a general perspective showing the structural arrangement of the mounting and adjustments for the sand-belt whereby obstructing parts have been eliminated from the space between the upper and lower runs thereof to afford complete freedom in the manual manipulation of a trowel or a sand-block.

The sand-belt 1 is carried by two rollers; the driver 2 and the idler 3. As in all belt sanders, provision is made for adjusting the center-distances of these rollers to obtain the desirable tension on the belt, and likewise provision is made for so adjusting the relative angularity of the axes of the rollers that the belt will "track" properly. Conventionally, such adjusting means are located in and occupy the space between the rollers and the upper and lower sections of the belt. Unlike such conventional arrangements, however, it is to be noted that, in accord with this in-

vention, this space is freed from all such adjusting means; they now being located outside this space, thereby enabling the user to manipulate a hand-block or trowel without interference for table sanding.

A single rotary shaft **4** extends through, and is journaled within, a tube **5** which is supported near one end by a T **6** clamped by a bolt **7** to a tubular standard **9**. Clamped to the tube at one side of the T **6**, is a motor bracket **8**, and at the other side of the T, is a table bracket **10**. On the adjacent projecting end of the shaft **4**, is a drive pulley **11**, and secured to its extremity is a disc **12** having a sand disc **13** cemented to its outer face. The other end of the shaft **4** carries the driver **2** for the sand-belt.

The end of the tube **5** adjacent the driver **2** provides the sole support for the tiltable sand-belt unit. A split sleeve-like member **14** has two lugs **15** and a clamp-bolt **16** for cramping said member **14** immovably to the tube and it also has two stop lugs **17** at 90° apart which are useful in swinging the unit definitely into a horizontal or vertical position. A T **18** is journaled on the member and provides a clamp-bolt for locking it in any desired position of adjustment. To restrain the T from creeping laterally when it is adjusted, it has a lug **19** which carries a conically pointed screw **20** that fits into a groove **21** provided by an exposed circumference of the member **14**.

This T **18** has an off-set bore to receive an elongated tube **22** which is immovably secured thereto by suitable means such as the set-screws **23** and yet admits of being re-set or removed and replaced by a tube of different length. This affords an immediate adaptation of the machine for long or short sanding belts.

The idler **3** for the remote end of the sand-belt is carried at the outer end of the tube **22**; its mounting providing a plurality of independent adjustments so that, whenever any belt is inserted, it may be caused to "track" properly. This mounting comprises a slidable carriage A having a hub **24** bored to have a sliding fit on the tube **22** such that the distance between the driver **2** and idler **3** may be yieldably varied during the running of the sand-belt and thereby maintain the latter under an uniform tension at all times. This is important for a sand-belt has a certain amount of stretch which varies with humidity of the air and the friction it encounters during usage. To accomplish this function, there is a spring **25** which bears at its ends on some part of the carriage and on a fixed stop secured to the tube. A lug **26** extending from the hub **24** provides a convenient part for the one end of the spring; while a split collar **27** adapted to be clamped by a bolt **27a** constitutes the fixed stop. Associated with these elements, there is also provided means for adjusting the alignment of the carriage with respect to the horizontal plane of the axis of the driver **2**, and also for maintaining such alignment during the relatively slight shifts of the carriage under the tension of the spring **25**. This means comprises a stud **28** secured to the lug **26** and having its free end entering the space between two opposing screws **29** and **30** carried by the two prongs provided by the split collar **27**. By adjusting these two screws, the carriage may be rotated more or less on the tube to regulate the aforesaid alignment; the ends of the screws not being tightened unduly on the stud **28**. A nut **38** on the extremity of the stud serves to limit action of the spring **25**, while its tension may be regulated by the position of the adjustable collar **27**.

Sand belts are usually more or less individual in respect to their "tracking" tendency because their length at one edge is often different from that at their other edge. To compensate for this tendency, provision is made for canting the axis of the idler with respect to the transverse plane of the axis of the driver. This means comprises a swivel journal for the near end of the shaft of the idler and a shiftable swivel journal for its other end. To a lug **31** is pivoted the swivel journal **32** to enable it to rock about an axis transverse to that of the driver **2**. An arm **33** extends adjacent the idler between and through the upper and lower runs of the belt and carries a stud **33a** which, by means of opposing nuts **34** and **35**, can be adjusted longitudinally. Pivoted to the remote end of the stud **33a** is a journal **36**. The shaft **37** of the idler is thus positioned by the two pivoted journals **32** and **36** and is thereby adjustable as aforesaid.

It is noteworthy that the tube **22**, as well as the means for adjusting the tension and alignment of the belt, are all located outside of the space between the upper and lower runs. This results in a unit which can not only be swung to various positions in a vertical plane but which also serves for block-sanding; there being no element to obstruct the free manual sweep of the trowel or press-block. This is of much value to the user for it enables him to sand either extensive areas of a board resting flatwise on the bench, or local regions thereof. It also enables him to sand the vertical or sloping sides of any object too heavy or bulky to be handled readily; the unit being in such cases swung to the appropriate angle. To prevent the hand-block from being accidentally carried so far in the direction of travel of the belt as to engage a roller, a stop member **33b** is provided. This may conveniently be formed in one piece with the arm **33** extending from the member **24**.

To accommodate boards or objects of considerable thickness, the aforesaid unit can be elevated to various heights from the bench. The T **6** has a side lug **39** threaded to a vertical screw **40** which has a thrust bearing at its lower end at **41** on a split collar **42** which in turn rests on the hub **43** of the foot **44** that carries the post **9**. By turning the crank **45** at the upper end of the screw **40**, the adjustment in elevation is done; first releasing the clamp bolt **7**. It will be observed that the foot **44** is triangular in outline and the post **9** is located close to its long side. Adjacent the vertices, the post has holes for bolts or lag-screws for securing it to the bench, table, or floor as the case may be. This construction enables the full off-set of the belt with respect to the post to be utilized in sanding wide boards without interference from the foot.

To swing the unit into any convenient position in a horizontal plane, a clamp bolt **46** is first also released to enable the collar **42** to turn about the post under the side pressure of the screw **40**.

It has been mentioned that the members **5** and **22** are tubular and this is important from a number of standpoints. It enables the manufacturer to produce strong elements at a low cost and yet to adhere so closely to dimensions that various lengths are readily interchangeable to meet the desires of the user for such belt lengths as will best serve his purposes. Furthermore, these elements can be utilized as self-contained conduits for removing saw-dust and grit which

otherwise would be detrimental to the health of the user.

At the extremity of the tube 22 there is a shield 47 which partially encases the idler 3 with some clearance. A hollow elbow 48 terminates in a split end so that it may be gripped to the tube by a clamp bolt 49. It is thus easily removable so that the end of the belt may be used, if desired, as a drum sander for concave curves. Where the tube 22 enters the T 18, its end is apertured to register with a side opening (shown by Fig. 5) in the branch of the T and, at this opening there is held, by a bolt 50, a suction hood 51 having a dust collecting shield 52 for the driver 2 and a branch 53 adapted to be attached to a suitable source of suction. Shutters 54 and 55 enable the draft to be concentrated where most desired.

This dust-removing arrangement will be seen to be "built-in" so as to be equally serviceable in all positions of adjustment of the unit without any attention on the part of the user.

For flat sanding relatively small pieces, the upper run of the belt may be utilized. To that end, a thin shelf 56 sets closely to the belt so as to hold it against deflection when an object is pressed against its upper run. This shelf is supported by an off-set lug 57 which, by the bolt 58, is clamped to the tube 22. At one end, this shelf has a depending curtain 59 to shield the driver 2 when the user is doing block-sanding. It will be observed that this shelf, being relatively thin, does not interfere with the manipulation of a block between the upper and lower runs of the belt.

A work-rest 60 is located at one end of the belt-supporting shelf and may be set at any desired angle to the belt according to the need of the work in hand. It has a semicircular flange 61 and slot 62 which, by means of a clamp-bolt 63, secures it to a side-plate 64 at the desired angle. This rest 60 may have a cross-groove 65 for guiding a mitre-gauge for obtaining compound-angles or for sanding to dimensions.

Since the unit may be swung into any position from horizontal to vertical, it is readily available for various types of work, as will be appreciated.

For edge sanding, particularly where a close adherence to dimension is desired, the disc-sander 12 previously described is available. A work-rest 66 pivoted at 67 may be set at various angles to the disc and retained by a clamp bolt 68 operating through a slotted segment 69 which preferably is graduated. A transverse groove 70 serves to guide a mitre-gauge as will be understood. To collect the dust from the disc, there is provided a hood 71 having an outlet 72 for ready attachment to a source of vacuum.

The power for driving the sander is derived from a motor 73 carried by the unit. Thus, the platform 74 (to which the motor is bolted) has a pair of depending guide rods 75 adjustably held by the lugs 8^a and the set screws 76. This enables the tension of the drive-belt 77 to be adjusted properly. It will be observed that the collar 8 is concentric with the driven pulley 11 and this is of advantage because it enables the motor to be swung into the various positions most convenient according to the set-up of the other parts of the machine. Thus, when the sand-belt is set horizontally, the motor may be located so as to more or less balance the weights, and may likewise be shifted into a non-obstructing position desired when handling certain shapes of work.

It will be seen that boards of indefinite length may be readily block-sanded by this machine even when a relatively short belt is used, the boards in that case being shifted longitudinally on the table to bring its successive regions into the zone of the belt. However, if many long pieces are to be finished, a greater length of belt is desirable and this becomes available by merely interchanging the illustrated tube 22 by a similar one of suitable length.

If the workpiece be wide and too heavy to be shifted laterally without undue effort, or if many operations of the sort are in prospect, it is preferable to utilize the work-carriage D shown by the drawings. At its four corners, this carriage has grooved rollers B which run on two tracks C arranged at the end of the bench and extending transversely to the length of the belt. These tracks are conveniently pivoted at one end so they may be swung out of the way when not needed, as shown by dotted lines in Fig. 3. The tracks thus oppose any longitudinal shifting of the board under the friction of the sand belt, but render it easy to shift the board laterally.

Without further analysis, the foregoing will so fully reveal the gist of this invention that others can, by applying current knowledge, readily adapt it for various utilizations by retaining one or more of the features that, from the standpoint of the prior art, fairly constitute essential characteristics of either the generic or specific aspects of this invention and, therefore, such adaptations should be, and are intended to be, comprehended within the meaning and range of equivalency of the following claims.

Having thus revealed this invention, I claim as new and desire to secure the following combinations and elements, or equivalents thereof, by Letters Patent of the United States:

1. A sanding machine combining a post; a shaft extending transversely thereto in off-set relation therewith; a sand disc mounted on the shaft adjacent the post; a drive pulley on the shaft between the disc and post; a mounting pivoted to said shaft, a motor carried by said mounting and belted to said drive shaft; a clamp provided by said mounting and adapted to be released to permit it to be swung in a horizontal plane about said post.

2. A sanding machine combining a post; a drive shaft arranged transversely thereto; a mounting for said drive shaft and carried by said post; a sand disc on one end of said shaft adjacent said post; a driving pulley for a sand-belt mounted on the other end of said shaft at a distance from said post; means for vertically shifting said mounting on said post; and a motor carried by said mounting and belted to rotate said shaft.

3. A sanding machine combining a foot adapted to be secured to a bench; a post uprising therefrom and located closely adjacent one side of said foot in off-set relation to the general contour of said foot; a mounting vertically movable on said post; an elevating screw between the foot and said mounting; a horizontal shaft journaled in said mounting in off-set relation to said post; a drum pulley on the extremity of said shaft remote from said post; an elongated supporting member carried by said shaft and extending transversely thereto; an idler carried by the unsupported extremity of said member in off-set relation therewith; means for adjusting the align-

ment of said idler; a sand-belt carried by the driving drum and said idler; a relatively thin shelf carried in off-set relation by said member to support the upper run of said sand-belt; and a motor for driving said shaft.

4. A sanding machine combining a vertical post; a horizontal member extending transversely of said post; a shaft extending through and journaled in said member; a driver on said shaft at one side of said member; an idler located at a distance from said driver; a tubular support pivotally mounted on the extremity of said member in off-set relation with both said driver and idler; means mounted on its extremity for supporting the idler; a hood arranged to direct the dust therefrom into the free end of the tubular support; a second hood for the driver at the pivoted end of the tubular member and adapted to be connected with a source of vacuum; a relatively thin shelf for supporting the upper run of said belt; and a table disposed transversely to the shelf and located at one end thereof.

5. A sanding machine combining a post; a shaft extending transversely thereto in off-set relation therewith; a T-mounting journaled on said post for supporting said shaft by said post; a sand disc mounted on the shaft adjacent the post; a drive pulley on the shaft between the disc and post; a motor mounted to swing in a vertical plane concentrically with said shaft and belted to said drive shaft; and clamp means adapted to be released to permit said post-supported elements to be swung as a unit in a horizontal plane about said post.

6. A sanding machine combining a post; a drive shaft arranged transversely thereto; a T-mounting for said drive shaft and carried by said post; a sand disc on one end of said shaft adjacent said post; a driving pulley for a sand-belt mounted on the other end of said shaft at a distance from said post; means for vertically shifting said mounting on said post; and a motor belted to rotate said shaft and mounted to swing about the axis of said shaft into adjustable positions in a vertical plane.

7. A sanding machine combining a foot adapted to be secured to a bench; a post uprising therefrom and located closely adjacent one side of said foot in off-set relation to the general contour of said foot; a T-mounting vertically movable on said post; an elevating screw between the foot and said T mounting; a horizontal tube held by said T mounting in off-set relation to said post; a shaft journaled in said tube; a drum pulley on the extremity of said shaft remote from said post; an elongated tube having one end pivotally supported by said horizontal tube extending transversely thereto; an idler carried by the unsupported extremity of said elongated tube in off-set relation therewith; a sand-belt carried by the driving drum and said idler; a relatively thin shelf carried in off-set relation by said member to support the upper run of said sand-belt; a motor for driving said shaft; and dust collecting hoods cooperating with said elongated tube to remove dust from the ends of said belt.

8. A sanding machine combining a vertical post; a horizontal member extending transversely of said post and supported at one end thereby; a driver journaled at the unsupported end of said member; an idler located at a distance from said driver; an elongated arm mounted at one end on the extremity of said member in off-set relation with both said driver and idler and having its unsupported end terminating adjacent said idler; means mounted on its said end for supporting the idler and providing adjustments for regulating both the distance and the angular relation of the axis of the idler with respect to the axis of the driver, said adjustments being located outside of the space between the upper and lower runs of the sand-belt carried by said driver and idler; a sand-belt carried by said driver and idler; means for rotating the driver and guard means carried by said elongated arms and extending into the space between the upper and lower runs of the sand-belt.

9. A sanding machine combining a post; a tubular arm extending transversely thereto; a shaft journaled in said tubular arm in off-set relation with said post; a drive pulley mounted on the shaft adjacent the post; a motor carried by said tubular arm and adapted to be swung about the axis of said shaft and belted to said drive shaft; and screw means for adjusting the elevation of said arm and parts carried thereby on said post.

10. A sanding machine combining a post; a drive shaft arranged transversely thereto; a mounting for said drive shaft and carried by said post; a driving pulley at one end of said shaft adjacent said post; a driving drum for a sand-belt mounted on the other end of said shaft at a distance from said post; means for vertically shifting said mounting on said post; and a motor carried by said mounting and belted to said driving pulley to rotate said shaft, said motor being adapted to be swung to one side of said post to clear the latter when the said mounting is lowered.

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