# United States Patent [19]

**MacCarthy, Sr.**

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[54] **IDLER PULLEY ADJUSTMENT DEVICE**


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[51] **Int. Cl.²** ..... **B24B 21/00;** B24B 23/06; B24B 25/00

[58] **Field of Search** ..... 51/135–148; 74/242.8, 242.15 R



[56] **References Cited**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 2,449,519 | 9/1948 | Sutton | 51/148 |
| 2,706,367 | 4/1955 | MacCarthy | 51/148 |
| 3,127,712 | 4/1964 | Krogen et al. | 51/148 |



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*Attorney, Agent, or Firm*—Jessup & Beecher



[57] **ABSTRACT**

A device for adjusting idler pulleys to insure proper alignment of two or more pulleys to prevent belt slippage. The device has a first adjustable member attached to a frame with a second adjustable member attached to the first. The first and second members are adjustable about mutually perpendicular axes. The idler pulley is supported on a shaft attached to the second member for rotation about a third axis, substantially perpendicular to the first two axes. An adjusting arm having a pair of substantially perpendicular slots controls rotation of the first member within limits.


**5 Claims, 3 Drawing Figures**

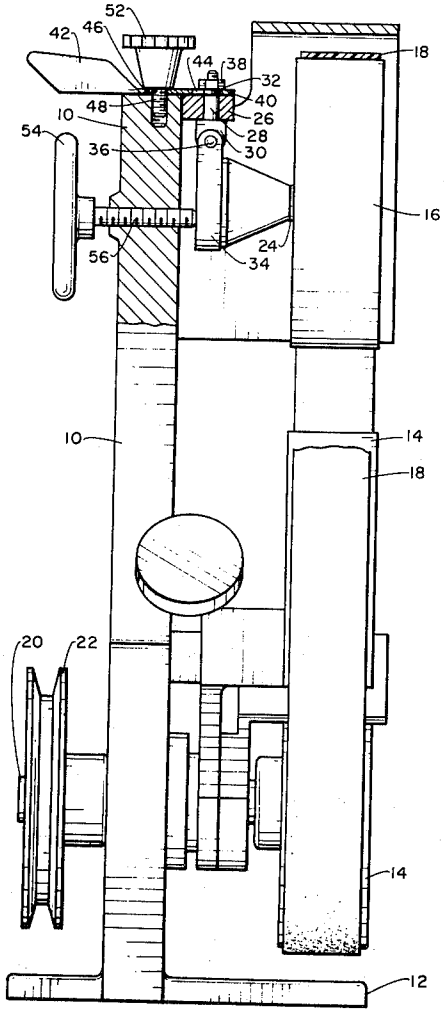


Fig. 1.

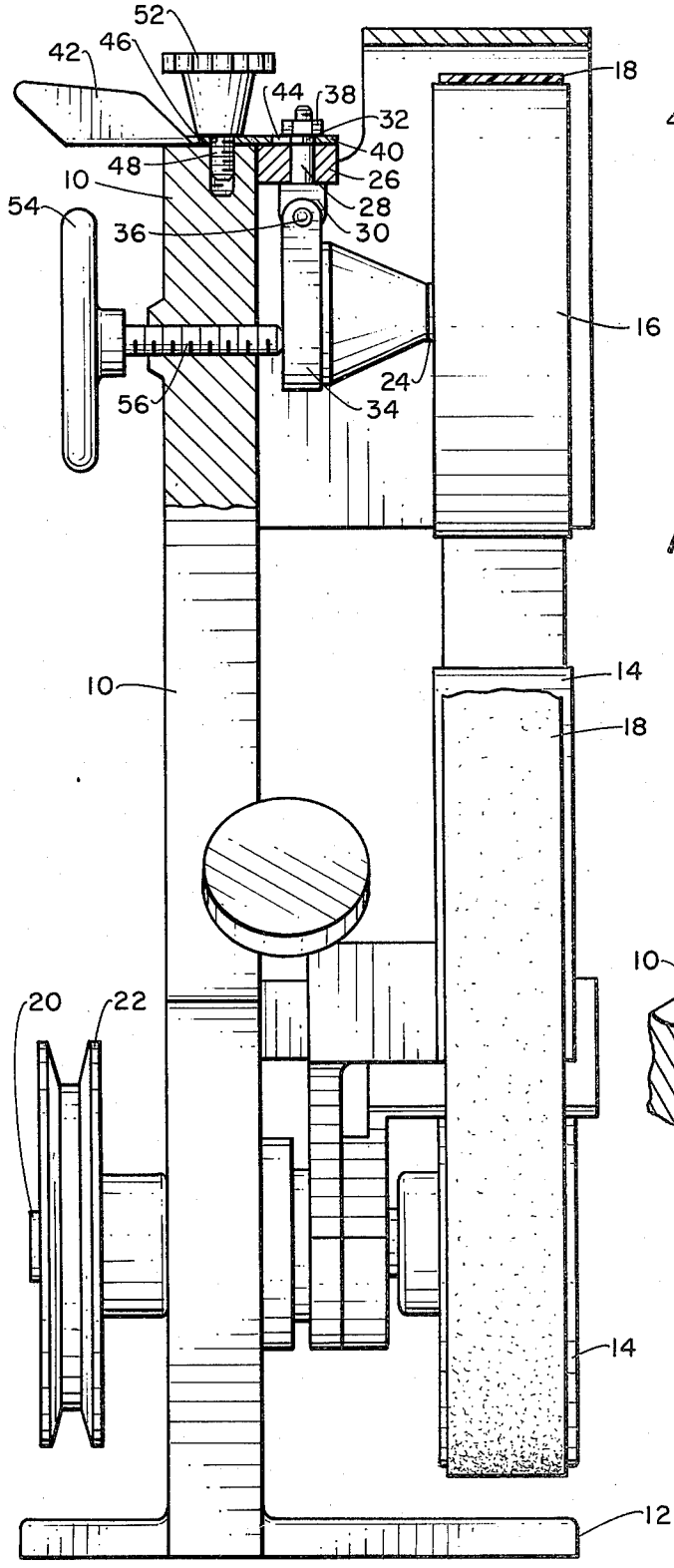



Fig. 2.

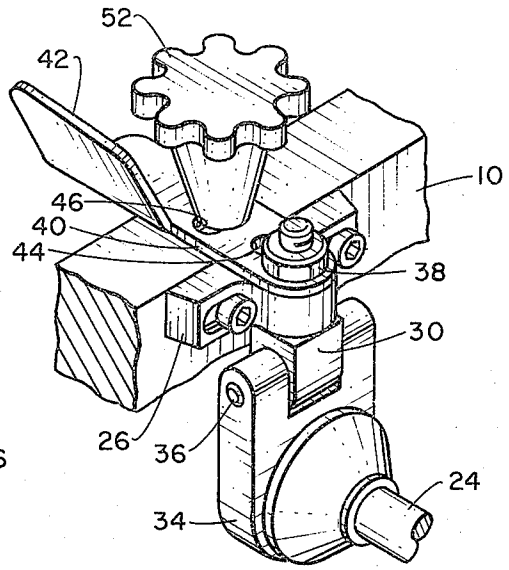
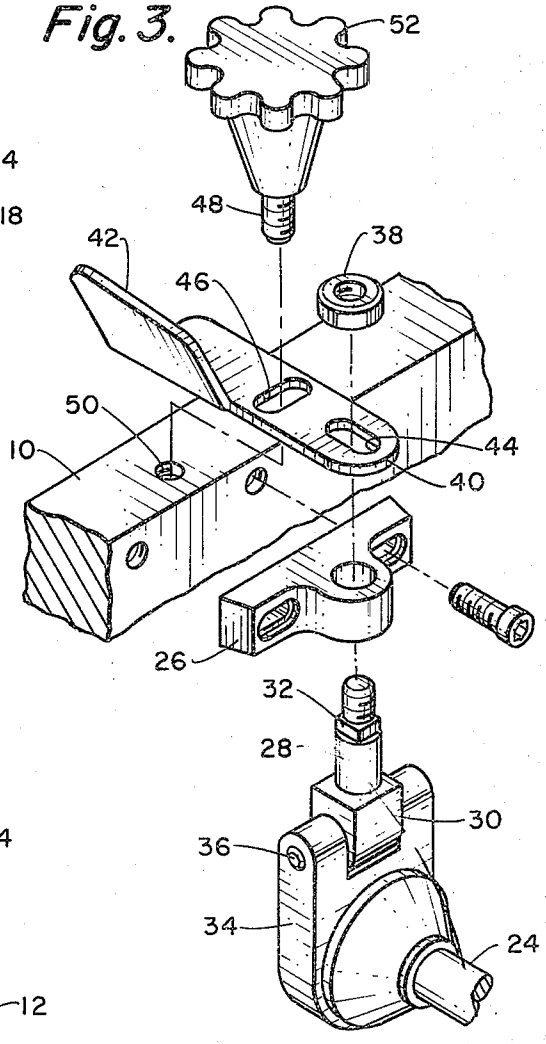



Fig. 3.



# IDLER PULLEY ADJUSTMENT DEVICE

## BACKGROUND OF THE INVENTION

This invention relates to devices for adjusting idler pulleys and more particularly to devices for adjusting such pulleys used in a belt sanding machine.

This device is an improvement of the adjustment means disclosed in U.S. Pat. No. **2,706,367** and is particularly useful in machines having a sanding belt tightly wound on three co-planar pulleys. A frequent problem with sanders of these types is the slippage and loosening of the sanding belt due to misalignment of the pulleys. At times, if not corrected, the belt may even come off which could result in damage to a workpiece or even injury. For this reason it is important that the belt be accurately centered on properly aligned pulleys during operation of the sander.

It was found that accurate centering of the belt was sensitive to alignment of the pulleys. This knowledge resulted in the development of the invention described in the above-mentioned patent. The adjustment device disclosed in that patent has provided a satisfactory solution to the adjustment problem. However, it was recently realized that improvements in the adjusting mechanism could be made.

Part of the mechanism included a finger having an off-center boss engaging an arm. The adjustment is not as simple as it could be because the adjusting finger can make a complete revolution of **360°**. Also the snug fit of the boss and arm can easily bind by being clogged with the dust from the sander.

Since only slight adjustments of the idler pulley are necessary, it was found that a flat adjustable arm using loose-fitting slots not only provided a much freer adjustment but also provided a convenient guide to limit the maximum adjustment. Also the device is easier to assemble and disassemble and has one less part.

It is one object of the present invention to provide an idler pulley adjustment device which has an adjusting arm with a slot for guiding and limiting maximum adjustment.

Another object of the present invention is to provide an idler pulley adjustment mechanism having an adjustment arm with mutually perpendicular slots which simplify assembly and disassembly and eliminate binding.

These and other objects will become apparent when the description is considered in conjunction with the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an end elevation of a belt sander in partial section illustrating the use of the adjustment device.

FIG. **2** is a perspective fragmentary view of the adjustment device as attached to a belt sander.

FIG. **3** is an exploded perspective view of the adjustment device as shown in FIG. **2.**

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **1,** a belt sanding machine is shown having an upright frame **10** and a base **12** for attachment to a workbench. The sander has a drive pulley **14** and may have two idler pulleys, one of which is shown at **16.** The pulleys **14** and **16** are substantially co-planar and are rotatably mounted on spaced horizontal axes. A sanding belt **18** is tightly wound on the pulleys **14** and **16.** The drive pulley **14** is connected by a shaft **20** to a V-belt pulley **22** which is coupled to any suitable drive means such as an electric motor.



In order to center and maintain belt **18** on the pulleys during operation of the sander, adjustment of one of the pulleys to insure proper alignment is necessary. Accordingly means for adjusting idler pulley **16** is provided. The adjusting device provides adjustment of shaft **24** supporting pulley **16** about two axes.

The adjustment device is supported by a hanger **26** bolted to the frame **10.** The hanger **26** has a hole through which the shaft **28** of a first adjustable member **30** passes. The shaft **28** terminates in a squared portion **32** which extends above the hanger **26.** A second adjustable member in the form of a pulley support **34** is rotatably attached to the first adjustable member **30** by a pintle pin **36** passing through the two members. Shaft **24** is rigidly attached to pulley support **34** and idler pulley **16** is rotatably mounted by suitable roller or ball bearings not shown.

The first adjustable member **30** is secured in the hanger **26** by a nut **38.** In between the nut **38** and hanger **26** is an elongated flat adjusting arm **40** which has a finger tab **42.** The arm **40** is provided with a first lengthwise slot **44** which closely fits the squared portion **32** of adjustable member **30.** A second slot **46** substantially perpendicular to slot **44** is provided to guide and limit adjustment of arm **40.** A threaded shaft **48** passing through slot **46** into threaded hole **50** in frame **10** guides and limits the adjustment of the arm **40.** After adjustment of the pulley **16,** the arm **40** is secured against arcuate movement by tightening down locking knob **52** integrally attached to threaded shaft **48.** Since both slots **44** and **46** are not tight fits, assembly and adjustment is simplified.

The adjustment of arm **40** is translated to a rotation adjustment of idler pulley **16** through the squared portion **32** of first adjustable member **30.** Adjustment about the other axis is accomplished through handwheel **54** and threaded shaft **56** whose end butts up against pulley support **34** below pintle pin **36.** The tension in belt **18** keeps the pulley support **34** constantly pressed against the end of shaft **56.** Rotation of handwheel **54** moves shaft **56** in or out, causing pulley support **34** to rotate about pintle pin **36.** To produce rotation of shaft **24** about a vertical axis, knob **52** has to be loosened and arm **40** arcuately adjusted by means of finger tab **42.** When the adjustment is set, knob **52** is tightened down securing arm **40** against any movement.

Obviously many modifications and variations will become apparent to those skilled in the art. Therefore, within the scope of the appended claims the invention may be practiced other than as specifically cited.

What is claimed is:

**1.** A device for adjusting an idler pulley comprising:

an upright frame;

a first adjustable member rotatably attached to said frame for adjustment about a first axis, said first adjustable member having a square shoulder portion terminating in a round threaded shaft;

a second adjustable member rotatably attached to said first member for adjustment about a second axis substantially perpendicular to the first axis;

an idler pulley rotatably supported by said second member on a third axis substantially perpendicular to said first two axes;

an elongated flat adjusting arm having a first lengthwise slot in one end engaging the square shoulder portion of the first adjustable member, said arm having a second slot substantially perpendicular to the first; and

guide means passing through said second slot for limiting arcuate adjustment of said first member.

**2.** The device according to claim **1** wherein said guide means includes:

means for securing said adjusting arm against arcuate movement after adjustment.

**3.** A belt sanding machine comprising:

a frame;

a drive pulley rotatably attached to said frame;

a first adjustable member rotatably attached to said frame, said first adjustable member having a square shoulder portion terminating in a round threaded shaft;

a second adjustable member rotatably attached to said first member for adjustment about a second axis substantially perpendicular to the first axis;



an idler pulley substantially co-planar with said drive pulley and rotatably supported by said second member on a third axis substantially perpendicular to said first two axes;

a sanding belt around said pulleys;

an elongated, flat adjusting arm having a first lengthwise slot in one end engaging the square shoulder of said first member, said arm having a second slot substantially perpendicular to the first; and

guide means passing through said second slot for limiting arcuate adjustment of said arm.

**4.** The belt sanding machine according to claim **3** wherein said guide means includes:

means for securing said adjusting arm against arcuate movement after adjustment.

**5.** The belt sander according to claim **3** further including a second idler pulley rotatably attached to said frame.

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