Oct. 27, 1970 C. H. OLTRA 3,535,827

SQUEEGEE SHARPENER

Filed May 21, 1968 3 Sheets-Sheet 1

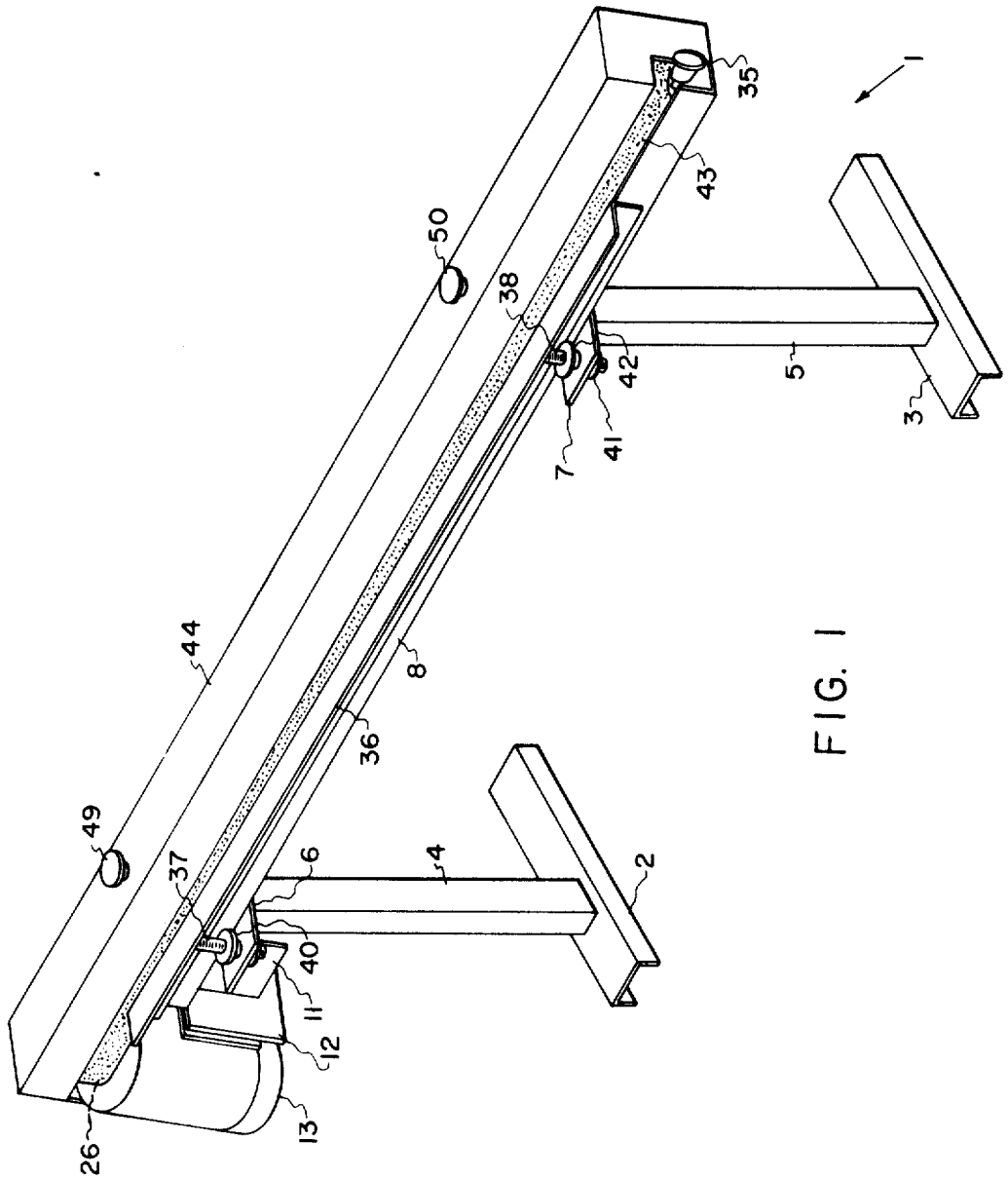


FIG. 1

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SQUEEGEE SHARPENER

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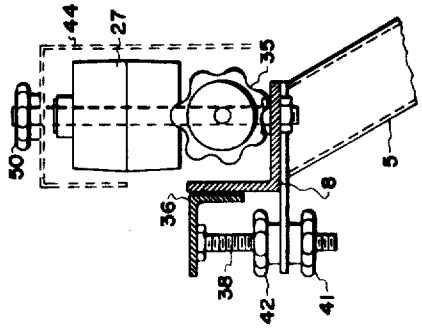


FIG. 5

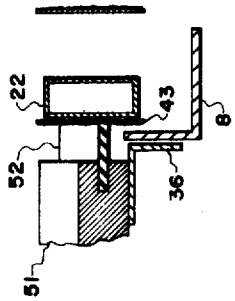


FIG. 6

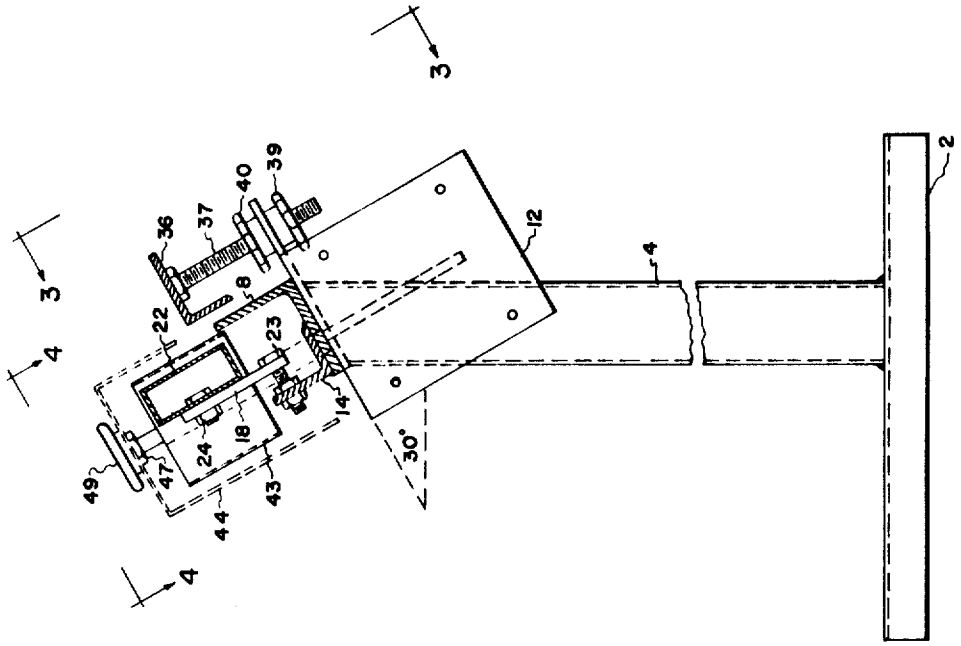


FIG. 2

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Oct. 27, 1970 C. H. OLTRA 3,535,827

SQUEEGEE SHARPENER

Filed May 21, 1968 3 Sheets-Sheet 3

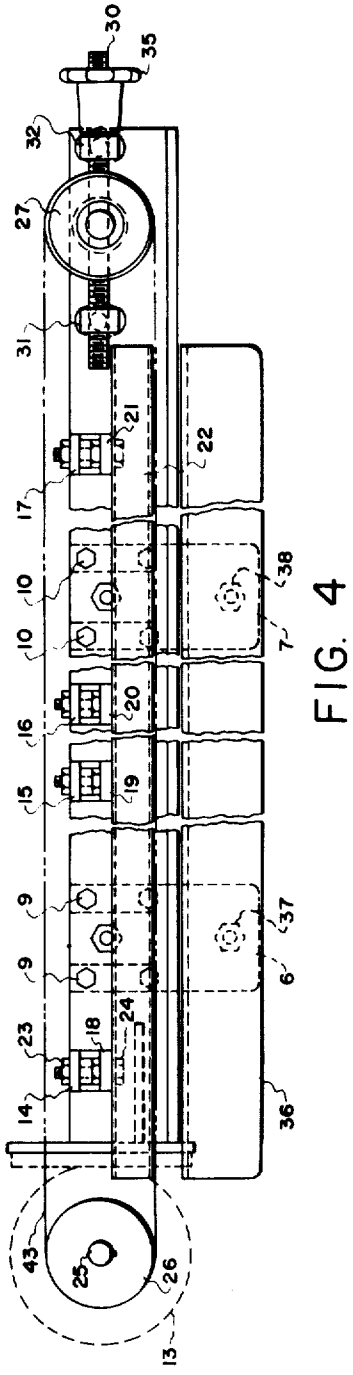


FIG. 4

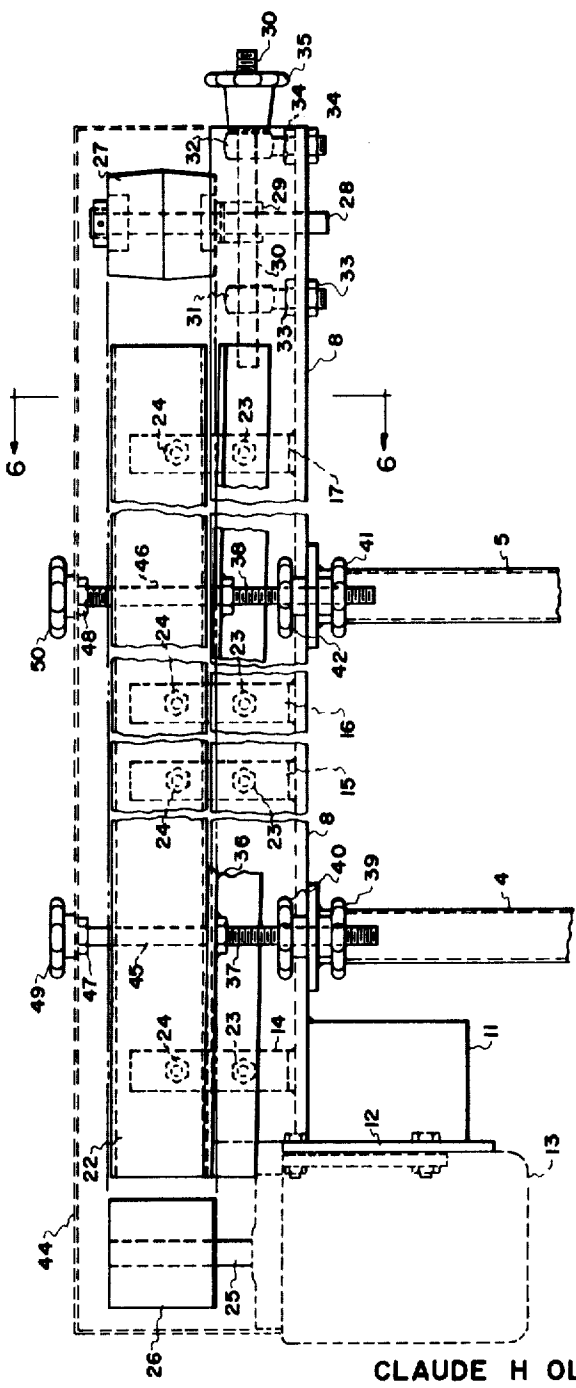


FIG. 3

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United States Patent Office 3,535,827 Patented Oct. 27, 1970

3,535,827

SQUEEGEE SHARPENER

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Filed May 21, 1968, Ser. No. 730,813
Int. Cl. B24b 21/00
U.S. Cl. 51—135 5 Claims

ABSTRACT OF THE DISCLOSURE

A squeegee sharpener of the endles belt type is arranged with the belt inclined relative to the support for the squeegee being sharpened so that the squeegee is sharpened across the entire width of the belt simultaneously, thereby causing wear on the sanding belt to be uniform. In addition, the axis of support for the endless belt is tipped at a substantial angle, e.g. 30° from the vertical, so that the belt provides a straight sharpening surface tipped at a sufficient angle to effect rapid and efficient unloading of particles removed by the sanding belt. The inclined position of the sanding belt furthermore makes the sharpening surface more easily accessible to the operator inasmuch as the squeegee can be held and sighted more readily for even application.

BACKGOUND OF THE INVENTION

Squeegees of the type used in silk screen printing equipment are usually formed of rectangular cross section of relatively hard rubber. The squeegee is normally supported in a long flat handle and must have its working side finished smoothly and as a straight and flat surface square with the rest of the squeegee. In smaller silk screen printing equipment using relatively short squeegees the sharpening of the squeegee has been relatively easy using simple sanding equipment. However, as squeegees have been made longer and longer for use in large size equipment it has become quite difficult to sharpen the squeegee properly without an excessive expenditure of time and effort. One of the more successful ways of sharpening long squeegees is by use of an endless belt type sharpener arranged with a feed table positioned so that the squeegee can be pressed evenly against an endless sanding belt provided with a suitable backing plate. In designing endless belt sanders for sharpening squeegees one of the major problems which has arisen has been the provision of a design which permits even wear on the sanding belt and also which provides for efficient removal of the dust or particles of the belt squeegee removed by the sanding belt during the sharpening of the squeegee.

One squeegee sharpener which has received considerable consumer acceptance and which solves certain of the problems involved in the sharpening of squeegees is shown in Fuchs U.S. Pat. 3,280,513. In the Fuchs patent the endless sanding belt is supported in a frame in a generally horizontal direction with the sanding belt positioned to provide a straight and generally vertical sharpening surface for the squeegee to be sharpened. There is provided a generally horizontal table for supporting and guiding a squeegee relative to and for engagement with the sharpening surface on the sanding belt. The apparatus is arranged for adjustment of the end supports of the sanding belt and adjustment of the position of the motor driving the sanding belt so that the belt extends at a substantial angle in respect to the feed table and the longitudinal axis of the squeegee being sharpened. This arrangement is such that the squeegee being sharpened engages the sanding belt across substantially its entire width and thus provides for substantially even wear on the belt. A principal disadvantage in the Fuchs apparatus is its substantially vertical design which makes it quite difficult for the operator

to sight along the squeegee being sharpened to insure that the squeegee is fed evenly and uniformly against the surface of the sharpening belt. In this prior art apparatus it is necessary for the operator to bend down to feed the squeegee evenly into the apparatus. Alternatively, it is possible for the prior art apparatus to be built to extend to a substantial height but this adds substantially to the expense of the sharpener. Another disadvantage in the prior art apparatus is the adjustable mechanism for supporting the motor and the drive pulley which adds to the complexity and expense. Accordingly, there has been a demand for an endless belt type squeegee sharpener which is shorter in construction and arranged for easy feeding of the squeegee against the sanding belt while permitting the operator to sight along the squeegee to insure even and uniform application of the squeegee to the sanding surface.

STATEMENT OF OBJECTS AND FEATURES OF THE INVENTION

It is therefore one object of this invention to provide a new and improved endless belt type squeegee sharpener having a construction which insures uniform wear on the sharpening belt, ease of feeding of the squeegee uniformly against the sharpening belt, and adjustment of the feeding relation of the squeegee being sharpened to the surface of the sharpening belt.

A feature of this invention is the provision of a new and improved endless belt type squeegee sharpener in which the sanding belt travels at an appreciable angle in relation to the feed table, the feed table being adjustable to determine the angle at which the squeegee is fed against the surface of the sharpening belt and thereby insuring uniform wear on the belt.

Another feature of this invention is the provision of a new and improved endless belt type squeegee sharpener which is positioned at a substantial angle, e.g. about 30° from the vertical, thereby permitting the squeegee to be fed evenly and uniformly against the sharpening belt surface and effecting a continuous discharge of dust or particles removed by the sharpening belt from the squeegee surface.

Other objects and features of this invention will become apparent from time to time throughout the specification and claims as hereinafter related.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings, to be taken as a part of this specification, there is clearly and fully illustrated a preferred embodiment of this invention, in which drawings,

FIG. 1 is an isometric view of a squeegee sharpener embodying the present invention in which the apparatus, including the endless sanding belt, is tipped at a substantial angle from the vertical for ease of feeding the squeegee uniformly for sharpening,

FIG. 2 is a view in left elevation of the squeegee sharpener shown in FIG. 1, with the motor removed and portions of the apparatus shown in section,

FIG. 3 is a view in elevation of the squeegee sharpening apparatus observed along the line 3—3 of FIG. 2,

FIG. 4 is a view of the squeegee sharpening apparatus observed from the line 4—4 of FIG. 2,

FIG. 5 is a detail end view observed from the right end of FIG. 3, and

FIG. 6 is a particle view in section taken approximately on the line 6—6 of FIG. 3, illustrating the application of a squeegee against the sharpening belt.

SUMMARY OF THE INVENTION

This invention comprises an improved endless belt sander for sharpening squeegees used in silk screen print-

ing. The squeegee sharpener includes a frame supporting an endless belt sander and is provided with a feed table positioned at an incline relative to the axis of movement of the belt so that the squeegee will be applied against the surface of the belt across its entire width, thereby permitting even and uniform wear of the sanding belt and further permitting the belt to quickly unload itself of dust or particles. The support table for feeding the squeegee into contact with the endless belt is adjustable to fit various widths of sharpening belts. The apparatus is arranged at a substantial tilt relative to the vertical so that the dust and particles removed from the squeegee being sharpened are discharged away from the operator. The angle at which the apparatus is tilted, e.g. about 30° from the vertical, also makes it possible for the apparatus to be supported on a shorter frame work and at the same time permits the operator to sight along the squeegee to feed it uniformly to the sharpening belt.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring in detail to the drawings and firstly to FIG. 1 there is shown a squeegee sharpener in the form of an endless belt sander **1** embodying the various novel features of this invention. The apparatus is provided with a supporting frame comprising supporting base members **2** and **3** from which there extends vertically supporting legs **4** and **5**. Supporting base members **2** and **3** are in the form of inverted channel members while upwardly extending legs **4** and **5** are formed of extruded members of square or rectangular cross section. At the upper end of leg members **4** and **5** there are welded in position supporting plate members **6** and **7** respectively. These supporting plates support the entire squeegee sharpener assembly in the manner to be subsequently described.

The squeegee sharpener assembly includes angle member **8** which is supported on plate members **6** and **7** by a plurality of bolts **9** and **10** respectively. At the left end of the apparatus as viewed in FIGS. 1 and 3 there are provided supporting plate members **11** and **12** which are welded on supporting angle **8** and provide a rigid support for electric motor **13** which drives the sharpening apparatus. At the rear of an angle **8**, as viewed in FIGS. 1, 3 and 4, there are provided a plurality of separate angle members **14**, **15**, **16** and **17**, respectively, which are welded in position and which support members **18**, **19**, **20** and **21** respectively, which form support for a longitudinally extending square or rectangular tube member **22** which provides a backing plate for the squeegee sharpener, and are connected to square tubing **22** by bolt and screen connections **24**.

At the left end of the apparatus as viewed in FIGS. 1 and 3 motor **13** is provided with drive shaft **25** and drive pulley **26** which is alined with the end of square backing tube **22**. At the right end of the apparatus there is provided idler pulley **27** which is supported on shaft **28**, which extends through a rigid supporting block member **29**. Supporting block member **29** is supported on threaded member **30** which is supported in eye-bolts **31** and **32**, which are supported in angle member **8** by nuts **33** and **34** respectively. The threaded member **30** is secured in and rotatable by handle **35** and is operable upon rotation to move supporting block **29** longitudinally of the apparatus for tightening the endless sanding belt used therein.

At the front of the apparatus as viewed in FIGS. 1, 3 and 4 there is provided a feed table **36** in the form of an angle iron member having threaded members **37** and **38**, respectively, secured thereon, as by welding, and extending through supporting plate members **6** and **7** respectively. Supporting member **37** is provided with a pair of hand adjustment screw knobs **39** and **40**. Support member **38** is similarly provided with hand operated adjustment members **41** and **42** respectively. Proper adjustment of members **39**, **40**, **41**, and **42** will cause supporting table or angle member **36** to extend at an angle relative to square or rectangular backing plate member **22** and the endless sanding or sharpening belt moving thereacross. The apparatus is provided with sanding belt **43** which extends from drive pulley **26** to idler pulley **27** and is supported by square or rectangular backing plate **22** for sharpening of elongated squeegees. When a sanding or sharpening belt **43** is to be installed in the apparatus, handle **35** is rotated to move supporting block **29** to move idler pulley **27** toward drive pulley **26**. In this position the belt is loose and an old belt may be removed and a new one installed. When a new belt is installed the handle **35** is rotated in the opposite direction to move supporting block **29** and pulley **27** away from drive pulley **26** to tighten the endless sanding or sharpening belt. After the sharpening belt is installed in position a cover member **44** is placed in position covering the top, back, and top portion of the front of the apparatus leaving only a relatively small opening for the squeegee to contact the sanding or sharpening belt. Cover member **44** is supported on threaded members or bolts **45** and **46** and held in place by nuts **47** and **48** and hand operated nuts or threaded members **49** and **50** respectively.

In FIG. 2, it is clearly shown that the entire sanding apparatus including sanding belt **43** and feed table **36** are tilted back at an angle of 30° from the vertical. Also, support table **36** is normally supported so that it extends diagonally across the face of sanding belt **43** along backing member **22** so that a squeegee supported on feed table **36** will contact the belt **43** across substantially its entire width and thus insure uniform wear on the sanding belt. In FIG. 6 there is shown a squeegee comprising handle **51** and squeegee blade **52** positioned on support table **36** and engaging endless sanding or sharpening belt **43** and pressing the same against rectangular backing member **22**.

OPERATION

The operation of this apparatus should be apparent from the description of the various parts thereof and their operating relationship but will be re-described for better understanding of the invention. The entire mechanically operating portions of the apparatus including the motor **13**, feed table **36**, backing member **22**, sanding belt **43**, cover member **44**, etc. are supported on legs **4** and **5** respectively tilted at a substantial angle from the vertical. In a preferred form of the invention, as illustrated in FIG. 2, the apparatus is tilted at an angle of 30° from the vertical although any suitable angle could be used ranging from 15 or 20° to as high as 60 or 70° C. An angle of 30° is preferred inasmuch as this permits the apparatus to be supported on legs **4** and **5** which are relatively short and yet permits the operator who is sanding or sharpening a squeegee blade to be able to sight accurately along the squeegee being sharpened and see that it is engaging the sanding or sharpening belt **43** uniformly and evenly. The angle at which the apparatus is tilted back from the vertical also provides for a more efficient discharge of dust or larger particles removed from the squeegee blade by the sanding or sharpening belt.

The sharpening belt is an endless flexible belt having an abrasive outer surface which may be of any suitable material, such as Carborundum or similar grit of for example 40–60 grit size. The sharpening or sanding belt is about the same width or very slightly wider than rectangular backing member **22** and pulleys **26** and **27**. The inclination of support table **36** in relation to sanding belt **43** causes squeegee blade **52** engaging the sanding belt to contact sanding belt across substantially its entire width so that the wear on the belt is uniform and even across its entire width.

This arrangement causes not only uniform wear on the sanding or sharpening belt **43** but also effects a more uniform sharpening of the squeegee along its entire length because the grit of the belt is not loaded for its travel along the entire length of the squeegee. The tilt of the

apparatus in range of 15–70° out of the vertical (a 30° tilt being preferred) causes the sharpening belt **43** to unload its particles rapidly and thus continually expose a fresh grit to the surface of the squeegee blade **52** being sharpened. The angle of tilt of the apparatus permits the operator who is sharpening squeegee blade **52** to hold it in position comfortably without stooping or bending and permits the operator to sight along squeegee blade to see that it is being applied evenly and uniformly against the surface of the sanding or sharpening belt **43**.

An accurately and smoothly finished squeegee blade is conveniently and quickly obtained with the endless sanding belt arrangement provided by the present invention.

While this invention has been described fully and completely with special emphasis upon a single preferred embodiment it should be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described herein.

I claim:

1. A squeegee sharpener comprises:

(a) an endless flat belt having an abrasive outer surface,

(b) generally cylindrical pulleys rotatable about an axis at each end of the belt and around which said belt provides for rotational support thereby, whereby said belt provides a straight sharpening surface for a squeegee to be sharpened,

(c) a table positioned for supporting and guiding a squeegee relative to and for engagement with said sharpening surface in a direction normal thereto,

(d) an elongated flat backing member positioned behind the portion of said belt to be engaged by a squeegee to be sharpened,

(e) said table being positioned and arranged at a substantial angle in relation to said pulleys and belt so that the belt sharpening surface travels at an angle in respect said table and consequently the longitudinal axis of the squeegee being sharpened,

(f) an electric motor having a drive shaft on which one of said pulleys is mounted to be driven thereby,

(g) and supporting legs for said sharpener supporting said sanding belt and flat backing member at a substantially fixed angle of 15°–70° behind the vertical, thereby facilitating the feeding of a squeegee into engagement with said belt evenly and uniformly without necessitating stooping or bending by the operator.

2. A squeegee sharpener as defined in claim **1** including means for adjusting the position of said supporting and guiding table relative to the surftce of the belt.

3. A squeegee sharpener as defined in claim **1** including a cover member supported in position enclosing the back, top, and upper portion of the front of the belt, leaving an opening adjacent to said guiding and supporting table.

4. A squeegee sharpener as defined in claim **1** including means for adjusting the position of the other of said pulleys relative to said one pulley driven by said electric motor to tighten said belt in position on said pulleys or to release said belt for removal and replacement.

5. A squeegee sharpener as defined in claim **1** in which said belt and flat backing member are positioned at an angle of approximately 30° out of the vertical, thereby facilitating the feeding of an elongated squeegee into engagement with said belt and facilitating the discharge of dust or particles removed from the squeegee by the belt.

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