May 28, 1957 H. D. TEETZ, SR 2,793,475

GUIDE AND HOLD-DOWN ASSEMBLY FOR MACHINES FOR ABRADING THE SURFACE OF FLEXIBLE MATERIALS

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Fig. 2.

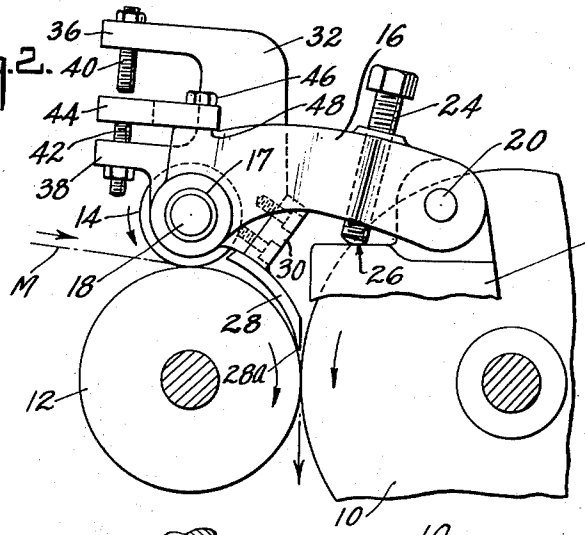


Fig. 1.

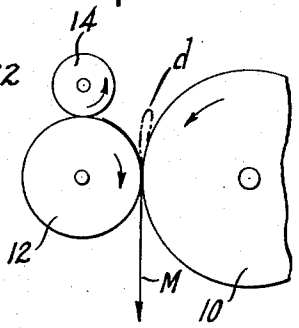


Fig. 3.

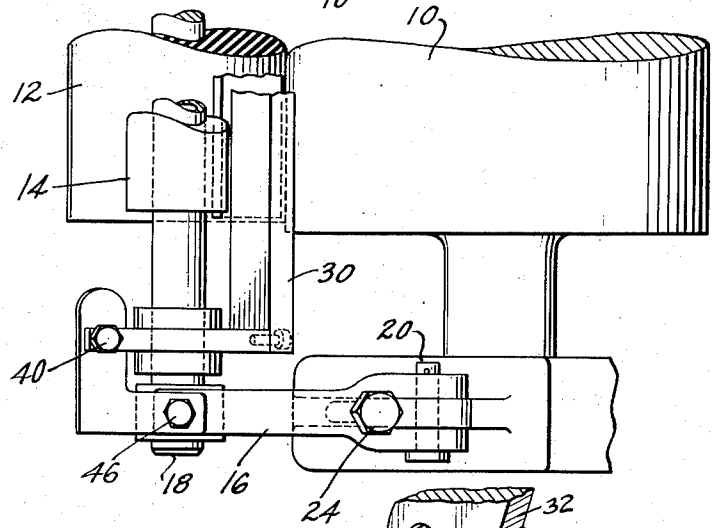


Fig. 4.

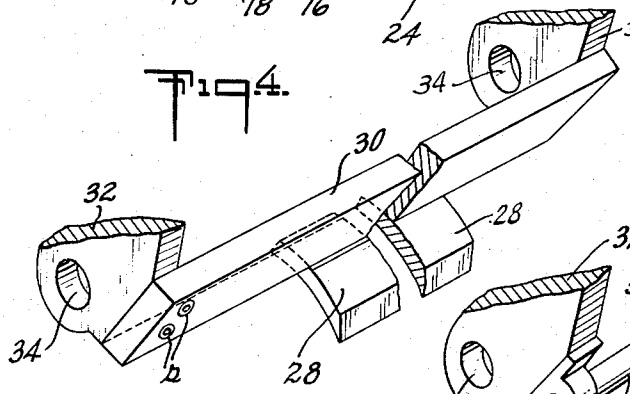
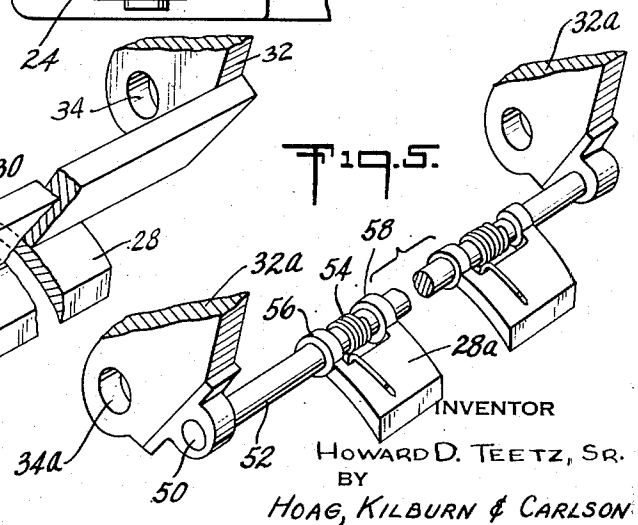


Fig. 5.



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GUIDE AND HOLD-DOWN ASSEMBLY FOR MACHINES FOR ABRADING THE SURFACE OF FLEXIBLE MATERIALS

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Application November 18, 1953, Serial No. 392,935

3 Claims. (Cl. 51—78)

This invention relates to apparatus which is auxiliary to apparatus for abrading the surface of flexible materials, to reduce such material to uniform thickness or for other purposes. More particularly the apparatus is to guide and hold down on a feed roll a sheet or length of material being fed to means for treating it such for example as an abrasive roll or drum travelling at a higher rate of speed than the feed roll.

In recent years it has been found advantageous to treat a wide variety of materials by the passing of them over a feed roll to an abrading surface, such as a drum covered with a sheet of sandpaper and rotated at high speed. Great difficulty has been encountered particularly in the treatment of flexible materials due to the fact that the trailing edge of the sheet or length of material tends to snap forwardly as soon as it is freed from the bite between a feed roll and a pinch roll or equivalent usually employed in conjunction with the feed roll, with the result that the trailing edge often doubles over against the abrasive roll and is cut and scored too much or too little in passing between the feed roll and the surface of the abrading roll and is thus damaged and becomes waste.

Further difficulty has been encountered in the treatment of flexible materials different portions of which are initially of different thicknesses. Prior art guides have not satisfactorily held down against the feed roll portions of the sheet or length of material adjoining high spots in the material.

Accordingly it is an object of the invention to provide improved guide and hold-down apparatus which may either be installed as an attachment on previously manufactured abrading equipment, or incorporated as an adjunct during the manufacture of such machines.

Another object of the invention is to provide means which will effectively prevent the snapping forward of the trailing end of flexible materials being abraded and thus avoid the damage and waste often resulting from such action.

Another object of the invention is to provide means for more effectively holding down a length or sheet of material on the feed roll throughout its entire width.

Other objects of the invention will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, arrangements of parts, and in the several steps and relation and order of each of said steps to one or more of the others thereof, all as will be pointed out in the following description, and the scope of the application of which will be indicated in the following claims.

The invention will best be understood if the following description is read in connection with the drawings, in which,

Figure 1 is an end view illustrating schematically the doubling over of the trailing edge of a sheet or length of material being abraded in a known abrading machine, after the trailing edge of the sheet or length of material has passed the pinch roll;

Figure 2 is an end elevational view of one embodiment of the invention shown applied to a known combination of abrading roll, feed roll and pivoted pinch roll;

Figure 3 is a plan view of the assembly of Figure 2, broken away and showning only one end portion of a combination of abrading, feed and pinch rolls and apparatus embodying the invention applied thereto, said apparatus being duplicated at opposite ends of said combination of rolls;

Figure 4 is a fragmentary perspective view, of the guide and hold-down means illustrated in Figures 2 and 3, adapted for mounting on the pinch roll shaft beyond the ends of the pinch roll; and

Figure 5 is a view similar to Figure 4 but showing guide and hold-down means comprising a number of separate members operative individually.

Abrading machines comprising the combination of abrading drum **10**, feed roll **12**, and pinch roll **14** shown in Figure 1, are well known and such machines are disclosed in Patents No. 1,975,349, October 2, 1934; No. 2,076,193, April 6, 1937; No. 2,253,558, August 26, 1941; and No. 2,253,559 August 26, 1941; issued to George M. Curtin. In such machines a sheet or length of material comprising a skin or length of fabric or other flexible material is led between feed roll **12** and pinch roll **14** before being engaged between the feed roll **12** and the roll **10** having the abrading surface which, as illustrated in the aforesaid patents, may be a sheet of sandpaper. In such machines the abrading roll usually rotates at a considerably higher speed than the feed roll and trouble has been encountered due to the fact that the trailing edge of flexible material being treated is snapped forward by the pull of the abrasive roll when it is free from engagement between the feed roll and pinch roll, and often doubles over with the result that it is damaged in passing in doubled over condition between the feed roll and the abrading roll and thus becomes waste. This is particularly the case in the treatment of skins and other material the trailing end of which becomes narrower adjacent the trailing edge and is thus particularly subject to being snapped forward and doubling over. A length of material *m* the trailing edge of which has been doubled over as at D is shown in Figure 1.

In Figure 2 apparatus comprising the invention is shown added to the combination of abrading roll, feed roll and pinch roll shown in Figure 1. In Figure 2 previously known means for pivotally supporting the pinch roll **14** is also shown, comprising an arm **16** such as is employed at each end of the pinch roll having the bearing **17** for receiving an end of the pinch roll shaft **18**, said arm **16** being pivotally mounted by pivot **20** on bracket **22** which is duplicated at the opposite end of the prior art machines. The elevation of pinch roll shaft **18** may be adjusted by adjustment of the adjusting screw **24** which extends through arm **16** into contact with the upper surface **26** of said brackets **22**.

To the above described known assembly I provide a curved guide and hold-down member **28** and means for supporting it so that its leading edge **28***a* will tend to contact a sheet or length of material on the feed roll in close proximity to the bite between feed roll **12** and abrading roll **10**.

Member **28** is shown projecting from a cross bar **30** having at its ends rearwardly extending brackets **32** having respectively the aligned openings **34** by which said brackets may be loosely hung on the respective ends of the pinch roll shaft **18** beyond the ends of the pinch roll **14**. Brackets **32** are secured to cross bar **30** by screws *s*. The assembly comprising cross bar **30** and guide and hold-down member **28** may pivot freely around shaft **18** irrespective of whether or not said shaft rotates with the roll **14** or is stationary with roll **14** rotating around it.

In order to provide limits to the oscillatory movement of the guide and hold-down assembly the brackets **32** may be formed as shown in Figure 2 with the two projecting, parallel, spaced arms **36** and **38**, with the adjustable contact screws **40** and **42** extending through said arms respectively toward one another on either side of a stop member **44** secured by screw **46** onto the flat top portion **48** of said arm **16**.

The guide and hold-down member **28** may be somewhat curved as illustrated in the drawings and preferably has its forward end portion tapered so that its leading edge **28***a* can extend close to the bite between the feed roll **12** and the abrading roll **10**. Since the center of gravity of the guide and hold-down assembly is well forward of its bearings **34** it will tend to pivot clockwise to bring the leading edge **28***a* into contact with the surface of material passing over the feed roll adjacent to the bite between the feed roll and the abrading roll. Preferably member **28** extends substantially from the periphery of the pinch roll **14** to the bite between the feed roll **12** and the abrading roll **10** and thus serves to intercept the trailing edge portion of a sheet or length of material as soon as it is freed from engagement between the pinch roll **14** and the feed roll **12** and prevents it from snapping forward. The leading edge **28***a* of member **28** continues to hold the sheet or length of material against the surface of the feed roll until the trailing edge of the material is about to enter the bite between the feed roll **12** and abrading roll **10** when there is not enough length of the material left above the bite between rolls **10** and **12** to permit it to fold over, and by that time the distance between the peripheries of rolls **10** and **12** is so slight that any such folding over is unlikely.

In Figure 5 a modification of the guide and hold-down assembly is shown in which brackets **32***a* are employed which may be similar to brackets **32** except for having the brackets **50** to receive the ends of a cross rod **52** which in this embodiment of the invention takes the place of the cross bar **30**, and on which a plurality of guide and hold-down members **28***a* are supported each independently rotatable around cross rod **52**. Since members **28***a* are of narrow width and of light weight compared with the mass of a unitary member such as **28**, spring means **54** are provided for increasing the effective weight of said members **28***a*. For this purpose the springs **54** may be wound around cross shaft **52** between the spaced sleeves **56**, **58** by which said members **28***a* are mounted for rotation around on cross shaft **52**, with one end **54***a* of each spring secured to said cross shaft and the other end **54***b* projecting against the member **28***a* with which it is associated.

It will be understood that apart from or supplementing the force of gravity member **28** may be controlled, to give any tension that may be desired on material passing through the device, as for example, by adjustment of the position of arm means **16** by adjusting screws **24**.

The brackets **32***a* have therein respectively the aligned openings **34***a* by which the bracket members may be loosely supported upon a cross shaft of the abrading machine to which they are applied, or of which they form a part, such for example as the pinch roll shaft **18**, as has been described above. The individual members **28***a* have the advantage over a continuous guide and hold-down member such as **28** of being able to maintain local portions of the sheet or length of material passing over the feed roll in closer contact with the feed roll. Each member **28***a* rests on the high spot of the particular portion of the sheet or length of material along the line of contact between said member **28***a* and said portion whereas the closest approach of member **28** to the sheet or length of material being processed is determined by the highest spot or point of greatest thickness along the line

of contact between member **28** and the sheet or length of material extending the full width of said sheet or length of material.

It will thus be seen that there has been provided by this invention an apparatus in which the various objects hereinabove set forth together with many thoroughly practical advantages are successfully achieved. As various possible embodiments might be made of the mechanical features of the above invention and as the art herein described might be varied in various parts, all without departing from the scope of the invention, it is to be understood that all matter hereinbefore set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

What I claim is:

1. In a machine for abrading the surface of flexible materials the combination of a rotary abrading roll, a feed roll coactive with the abrading roll to feed the material to the abrading roll, a pinch roll coactive with the feed roll to feed the material to the abrading roll, pivoted arms providing journals for the pinch roll shaft, means for adjusting said arms to regulate the position of said pinch roll relative to the feed roll, and an assembly for holding down work being fed over the feed roll to the abrasive roll mounted on said pinch roll shaft for rotation around said shaft, said assembly comprising a cross rod, brackets extending rearwardly from said cross rod for hanging said brackets on the opposite ends respectively of said pinch roll shaft, and a number of guide and hold-down members rotatably mounted on said cross rod and projecting forwardly and downwardly from said cross rod and extending substantially to the bite between the feed roll and the abrading roll.

2. In a machine for abrading the surface of flexible materials the combination of a rotary abrading roll, a feed roll coactive with the abrading roll to feed the material to the abrading roll, a pinch roll coactive with the feed roll to feed the material to the abrading roll, pivoted arms providing journals for the pinch roll shaft, stop members on said pivoted arms respectively, means for adjusting said arms to regulate the position of said pinch roll relation to the feed roll, and an assembly for holding down work being fed over the feed roll to the abrasive roll mounted on said pinch roll shaft for rotation around said shaft, said assembly comprising a pair of brackets each bracket comprising two parallel arms projecting on opposite sides of one of said stop members, and adjustable contact screws extending through said arms respectively toward said stop member to provide limits to the swinging movement of said assembly around said pinch roll shaft.

3. The device claimed in claim 1 including spring means individual to said guide and hold-down members respectively, acting to swing said members downwardly around said rod.

References Cited in the file of this patent

UNITED STATES PATENTS

636,970	Feix	Nov. 14, 1899
908,115	Maze	Dec. 29, 1908
954,376	Buss	Apr. 5, 1910
1,208,116	Feix	Dec. 12, 1916
1,566,358	White	Dec. 22, 1925
1,933,665	Duplessis	Nov. 7, 1933
1,952,634	Spry	Mar. 27, 1934
2,170,901	Jorgensen	Aug. 29, 1939
2,278,138	Paardecamp	Mar. 31, 1942
2,305,879	Leach	Dec. 22, 1942

FOREIGN PATENTS

39,648	Norway	Sept. 1, 1924