Nov. 18, 1924. 1,515,892

P. A. SOLEM

ABRADING CYLINDER

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Fig. 1.

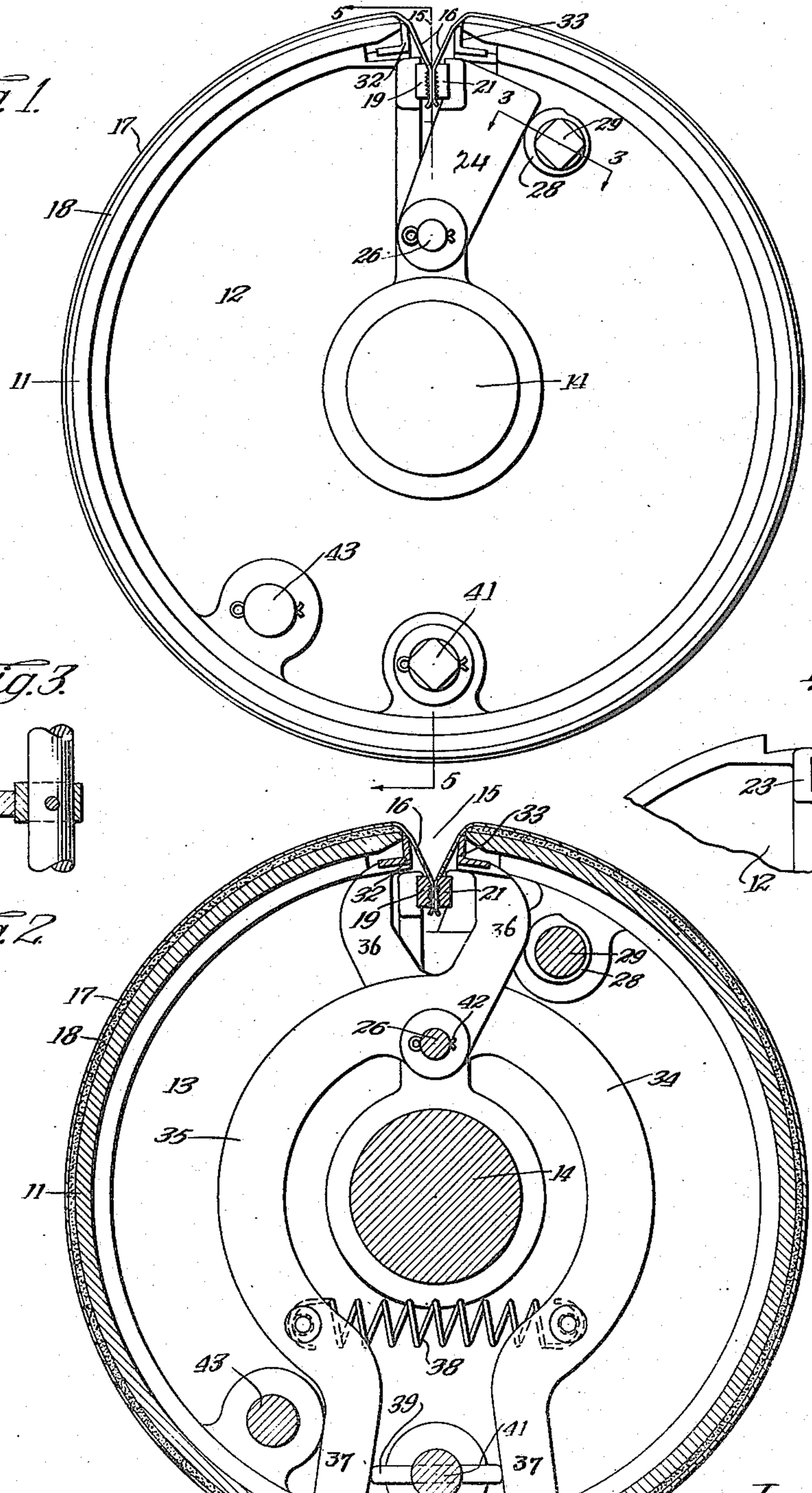


Fig. 3.



Fig. 2.

Fig. 4.







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Fig. 5.

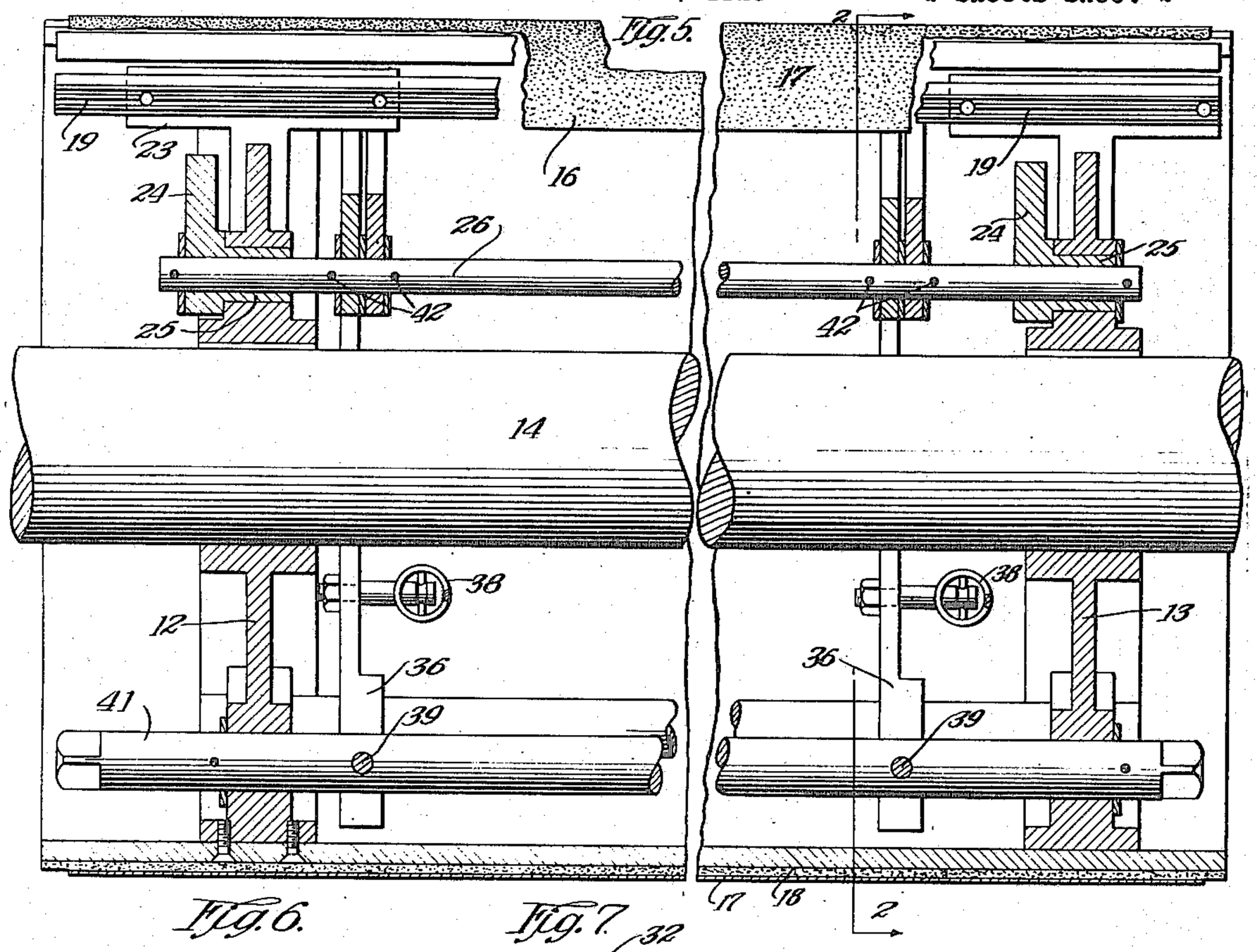



Fig. 6.

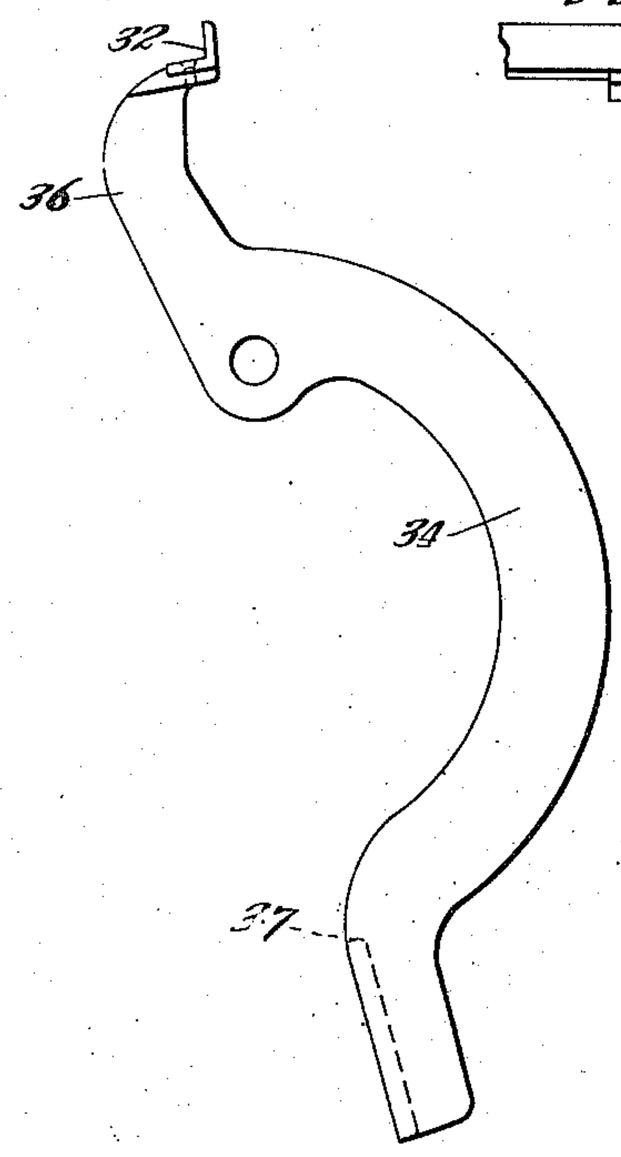



Fig. 7.

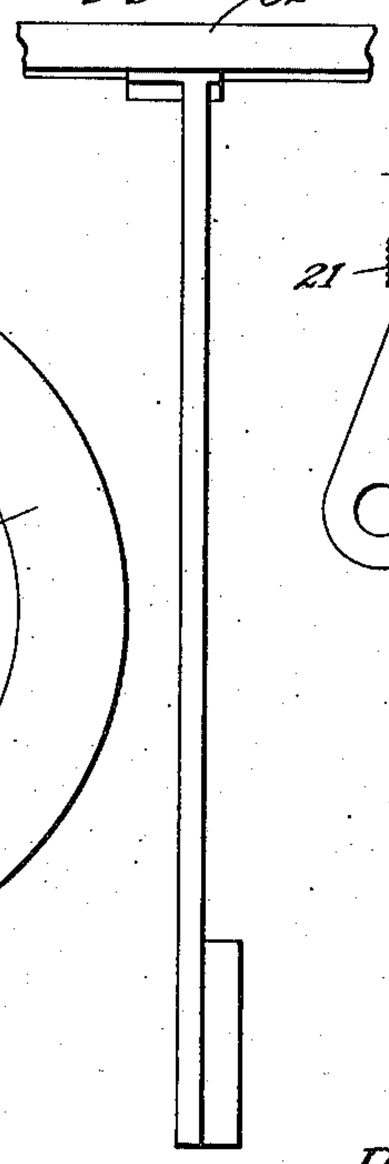



Fig. 8.

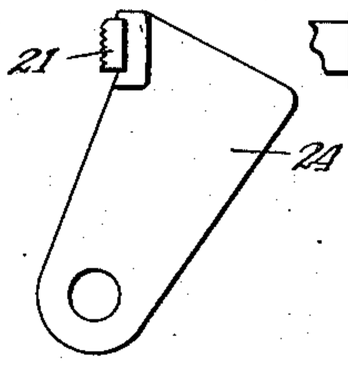
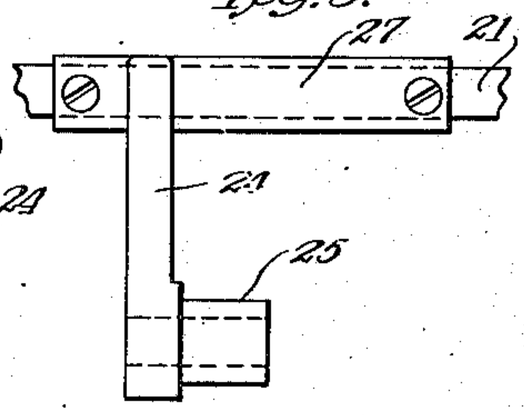



Fig. 9.

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# UNITED STATES PATENT OFFICE.

PETER A. SOLEM, OF ROCKFORD, ILLINOIS.

## ABRADING CYLINDER.

Application filed December 8, 1923. Serial No. 679,403.

*To all whom it may concern:*

Be it known that I, PETER A. SOLEM, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Abrading Cylinders, of which the following is a specification.

This invention relates in general to abrading and polishing cylinders, and has more particular reference to the means for stretching and holding an abrading web or the like on a cylinder, and to the construction of the cylinder so far as it is related to the web-holding means. And, while my improvements in the present instance have been especially designed for use in a sander, that is, a machine for sanding or abrading by means of a rotating cylinder faced with sandpaper or any suitable abrasive material, it should be understood that they are of general application in the stretching and holding of any kind of a web or like facing on a cylinder.

One of the primary objects of my invention is to provide a device of the character in which the rim of the cylinder has a relatively narrow longitudinal opening through which the ends of the abrading web are passed to the interior and anchored, it being apparent that the narrower the opening the greater will be the amount of abrading surface presented for action; and furthermore, to provide a compact means for holding the ends of the web and for stretching the web on the cylinder, this means being so constructed that the ends of the web need only extend but a short distance within the cylinder; thus effecting economy in abrasive material, and the web-holding and stretching means occupy a comparatively small space yet allow and provide for a large stretching movement.

Another object is to provide for quick and easy setting and adjustment of the abrading web so as to require the least amount of time and attention on the part of the operator.

I have also aimed to provide a device as described which is constructed in such simple and novel manner as to be thoroughly practical and satisfactory for the purposes intended, and which may be produced at a comparatively low cost.

Other objects and attendant advantages will be appreciated by those skilled in this art as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawings, in which—

Figure 1 is an end elevation of an abrading cylinder embodying my invention;

Fig. 2 is a cross-section through the cylinder taken substantially on the line 2—2 of Fig. 5;

Fig. 3 is a detail section taken on the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary detail showing the mounting of the stationary jaw on one of the disk frame members;

Fig. 5 is a longitudinal sectional view through the cylinder taken substantially on the line 5—5 of Fig. 1;

Fig. 6 is an elevation of one of the tension-imposing arms;

Fig. 7 is an edge view of said arm;

Fig. 8 is an elevation of one of the swivel jaw-carrying arms; and

Fig. 9 is an edge view thereof.

The cylinder shown in the drawings is of the type used in a sanding machine, and comprises a rim 11 supported by a pair of disk frame members or spiders 12 and 13 in turn mounted on and fixed to a main driving and supporting shaft 14. A greater number of disk frame members may be employed, the number of intermediate members depending on the length of the cylinder. In the rim of the cylinder, there is formed a comparatively narrow longitudinal slot or opening 15 reaching in this case from end to end thereof, through which opening the ends 16 of an abrading web 17 are adapted to be passed or threaded to the interior for anchorage. The web may be laid directly on the rim or upon a suitable cushion covering 18.

The web-holding means comprises in its preferred embodiment a pair of jaws 19 and 21 reaching substantially from end to

end of the cylinder, as shown in Fig. 5, or at least co-extensive with the length of the abrading web and being mounted so that the ends of the web may be passed between the jaws and firmly clamped and held thereby. For the purpose of holding a sanding web, the jaws are each in the form of a rod serrated on its face so as to improve its grip. Each frame member 12 and 13 is cut away as at 22, Fig. 4, providing clearance for the jaws, and is shaped to provide a wide seat or supporting part 23, as shown plainly in Fig. 5, to which the fixed or stationary jaw is rigidly attached. It will be observed that this jaw is positioned relatively close to the periphery of the cylinder so that the ends of the web, which are waste, will be as short as possible.

The jaw 21 is movable with respect to the stationary jaw 19 for the purpose of clamping and releasing the web end; and means is provided operable, from one end of the cylinder for quickly and easily moving the jaw 21 in a clamping and releasing action and for holding it fixed in the clamping position. This comprises a plurality of arms 24, two in the present instance, concentrically mounted on the frame members 12 and 13. I prefer to provide each arm 24 with a trunnion 25 journaled in the adjacent frame member as shown in Fig. 5, and to mount a shaft 26 concentrically within the trunnions for supporting certain parts which will be described hereinafter. Each arm 24 has at its outer end, a laterally reaching supporting part 27 to which the jaw 21 is fixedly attached. The shaft 26 is held against axial displacement by suitable means, such as cotter pins.

In order to move the arms 24 in the desired clamping action, I employ a rotary cam 28, Figs. 1 and 3, acting against the rear face of said arms and being fixed to a shaft 29 mounted for rotation in the frame members 12 and 13 and held against axial translation therein. One end of the shaft 29 is squared, as shown in Fig. 1, for attachment of a spanner wrench or the like, adapted to be used by the operator for revolving the cams and moving the jaw 21 either in a clamping or a releasing action. In view of the gradual incline of the cam faces and of the wedging action imposed thereby when tightening the jaws, the movable jaw will be automatically locked and held in its set, clamping position.

In order to stretch the web on the cylinder after clamping the ends between the jaws in the manner just described, I provide a pair of tension-imposing or stretching bars 32 and 33 positioned intermediate the jaws and the periphery of the cylinder with the end portions of the web between them. These bars likewise extend substantially the full length of the cylinder, and, in the present embodiment, are angular in cross-section. Said bars are carried by at least two pairs of arms or levers 34 and 35 pivotally mounted on the supporting shaft 26 above mentioned and each having an operating end 36 disposed at one side of a diametrical plane passing through the shaft 26, and an operated end 37 on the opposite side of said plane. The tension-imposing bars 32 and 33 are respectively rigidly attached to and carried by the adjacent ends 36 of said levers. A contractile spring 38 connecting the operating ends 37 of the levers 34 and 35 constantly urges said levers in a direction to thrust the bars 32 and 33 against the interposed web portions, thereby taking up the slack in the web and functioning to stretch the web over the cylinder. The tension bars may be separated, that is, withdrawn from the web, by the action of spreading or separating the operating ends 36 of the levers 34 and 35 against the pressure of the spring 38. This is done by means of an expander cam 39 interposed between the ends 37 of said levers and fixed to a shaft 41 adapted to be rotated from one end for putting the tension levers into or out of action. As shown in Fig. 2, the cam 39 is in the position holding the tension bars 32 and 33 out of action; and it will be manifest that upon turning the shaft 41 sufficiently to withdraw the cam 39 from the end 37, the spring 38 will be permitted to function for pressing the said tension bars against the web. Suitable means such as cotter-pins 42 through the shaft, 26 hold the levers 34 and 35 against displacement thereon.

It will be observed that the web-holding and clamping means are so constructed and arranged that the cylinder is counterbalanced, thus producing smooth running, and preventing uneven wear on the bearings for the shaft 14. Additional weight is provided to offset the shaft 29, at present this being in the form of a rod 33 diametrically opposite from said shaft.

While in the foregoing, I have illustrated a single working embodiment of my invention, it should be understood that in its broader aspect various changes might be made in details of construction, although the present form is thoroughly practical and has many advantages over the use of certain substitute parts or elements of which I am aware. For example, clamping rollers might be used in place of the jaws 19 and 21; likewise the tension elements might be mounted to slide in a tension imposing and releasing movement rather than to swing in arcuate paths. Furthermore, in the use of a movable jaw 21 as disclosed herein, other mechanical means might be employed for moving said jaw in a clamping and releasing action; and other mechanical means might be employed for opening and closing

the tension-imposing members, although that shown is well balanced, is easily operated for releasing the tension and functions automatically to impose the tension.

It will be further observed that the holding and stretching elements are so relatively arranged as to permit of a comparatively small opening 15 in the rim of the cylinder, thereby giving greater abrading surface than those constructions which inherently require a much wider opening. Also, said construction reduces the amount of waste at the ends of the web, for the reason that these ends are comparatively short. Another advantage of such construction and arrangement is that it enables a stretching action sufficient to take care of any condition or requirement. In this regard it will be observed that the particular embodiment shown is especially desirable because the upright flange of each angle bar 32 and 33 is positioned to engage the web relatively close to the periphery of the rim, whereby to pull almost directly in the peripheral plane when stretching the web. This obviously imposes less strain on the web and requires less pressure than in those constructions in which the inturned ends of the webs are at less of an obtuse angle and in which the stretching pull is from a point closer to the center of the cylinder. Because of the nature of the jaws employed, the ends of the webs will be held in a powerful vise-like grip, positively preventing them from being withdrawn. It will be further observed that the work may be quickly removed from or mounted upon the cylinder, these operations requiring only a simple manipulation of the shafts 29 and 41 from one end of the cylinder.

It is believed that the foregoing conveys a clear understanding of the objects prefaced above; and while I have shown in the drawings for purpose of illustration, but a single working embodiment, it will be manifest that many changes might be made in the construction and arrangement without departing from the spirit and scope of the invention as expressed in the appended claims, in which—

I claim:

1. In an abrading cylinder, the combination of a rim having an opening through which the ends of a web may be threaded to the interior, coacting jaws for holding said ends within the cylinder, and oppositely disposed tightening elements for engaging the interposed portions of the web between said jaws and the rim for tightening the web on the rim.

2. In an abrading cylinder, the combination of a rim having an opening through which the ends of a web may be threaded to the interior, oppositely disposed web-stretching elements underneath the lips of said opening, and means underneath said stretching means for clamping and holding the ends of the web.

3. In an abrading cylinder, the combination of a rim having an opening through which the ends of a web are adapted to be threaded to the interior, means for clamping and holding said ends, oppositely disposed coacting bars for imparting pressure against the web portions between said clamping means and the rim for tightening the web on the rim, means constantly urging said bars in a web tightening movement, and means for withdrawing said bars.

4. A device of the character described comprising a rotary cylinder, the rim of which has a narrow longitudinal opening, a web the ends of which are adapted to be passed through said opening to the interior of the cylinder, a pair of opposed jaws for gripping said ends substantially throughout their length, one of said jaws being stationary and the other movable in an opening and closing action, means for so moving the latter jaw, a pair of opposed tention-imposing members positioned intermediate the cylinder rim and said jaws with the web ends interposed, and means for pressing said members together against the interposed web ends for stretching the web on the cylinder.

5. In a device of the character described, the combination of a cylinder the rim of which has a narrow longitudinal opening for the reception of the ends of a web on the cylinder, means within the cylinder for holding said ends of the web, and a pair of web-stretching elements located between the web-holding means and the periphery of the rim with the web ends interposed and positioned for engaging said web ends close to said periphery, and means for relatively moving said elements toward and from each other in a web stretching and a releasing movement.

6. In a device of the character described, the combination of a cylinder having an opening in its rim for the reception of the ends of a web, means within the cylinder for clamping and holding said ends, a pair of levers pivoted within the cylinder substantially in the radial plane of said clamping means, each lever having an operating end disposed at one side of a diametrical plane and intersecting its pivot axis and an operated end at the opposite side of said diametrical plane, a web engaging element on the operated end of each lever, and means operative between the operating ends of said levers for moving said elements in a web-stretching and a releasing movement.

7. A device of the character described comprising a rim having a longitudinal opening through which the ends of a web are adapted to be threaded to the interior,

a plurality of axially spaced frame members supporting said rim, a jaw bar parallel with and in the radial plane of said opening and fixedly mounted on said frame members, a shaft disposed similarly to said jaw and mounted on said frame members, a plurality of arms pivotally mounted on said shaft and equipped at their outer ends with a jaw bar adapted to coact with said fixed jaw bar for clamping and holding the ends of the web, oppositely disposed web-tightener bars intermediate said jaw bars and the rim, and means pivotally supporting said web-tightener bars on said shaft.

PETER A. SOLEM.