

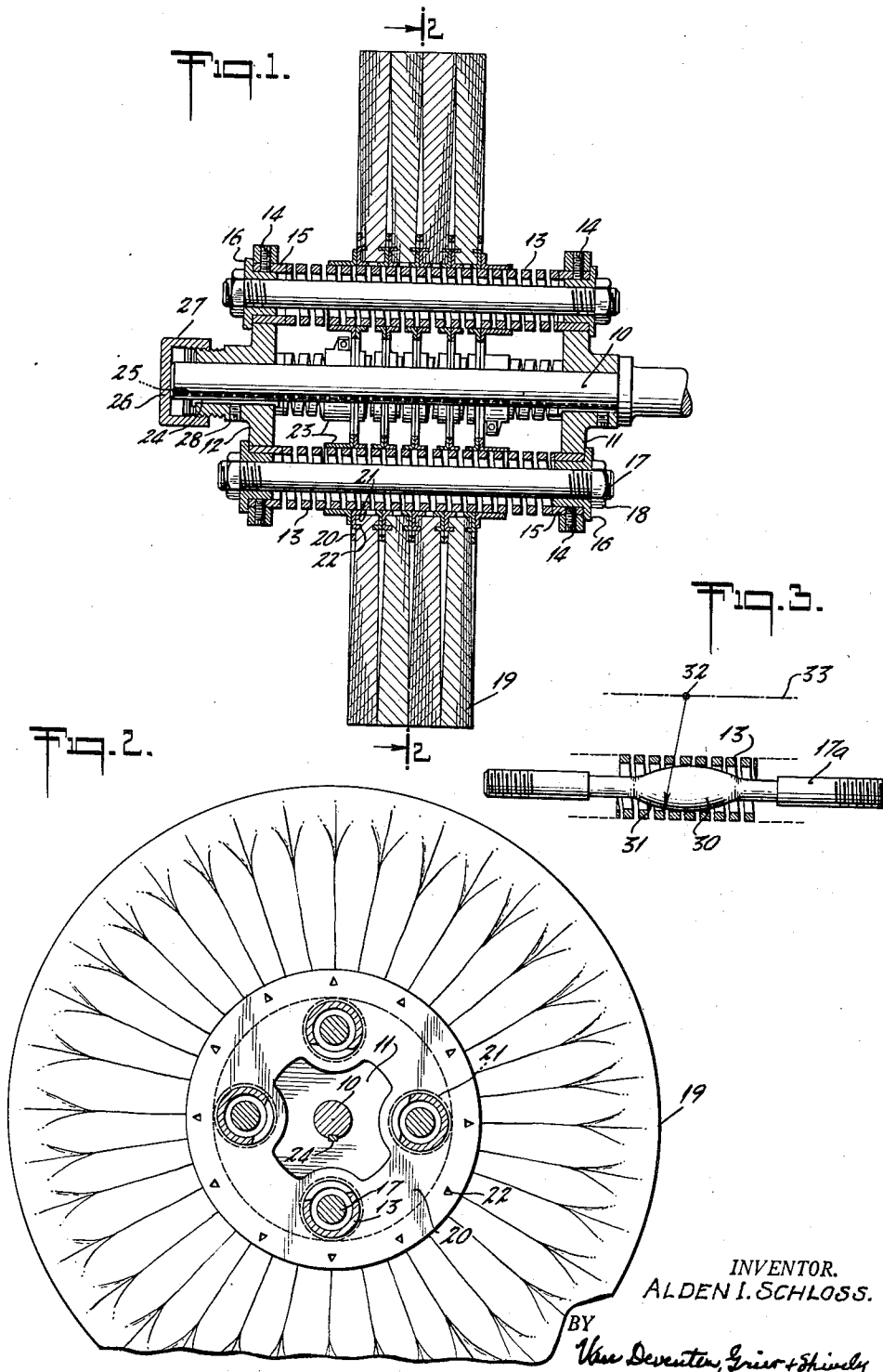
Jan. 9, 1951

A. I. SCHLOSS
ROTARY PROCESSING APPARATUS

2,537,792

Filed Nov. 26, 1947

2 Sheets-Sheet 1



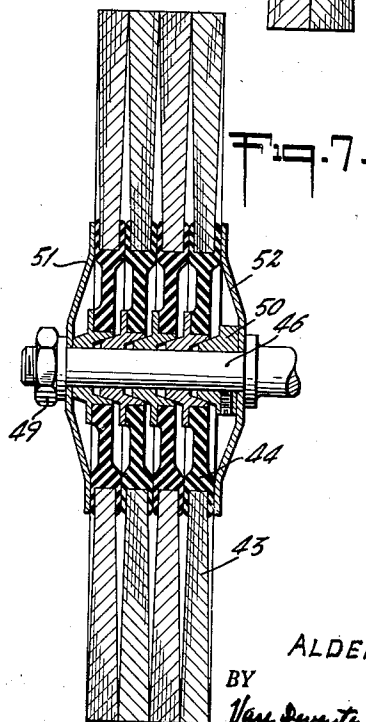
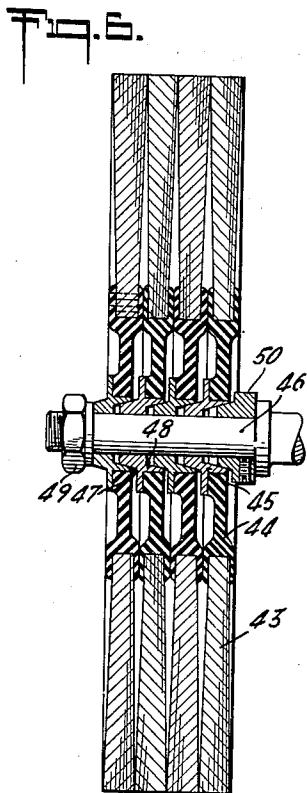
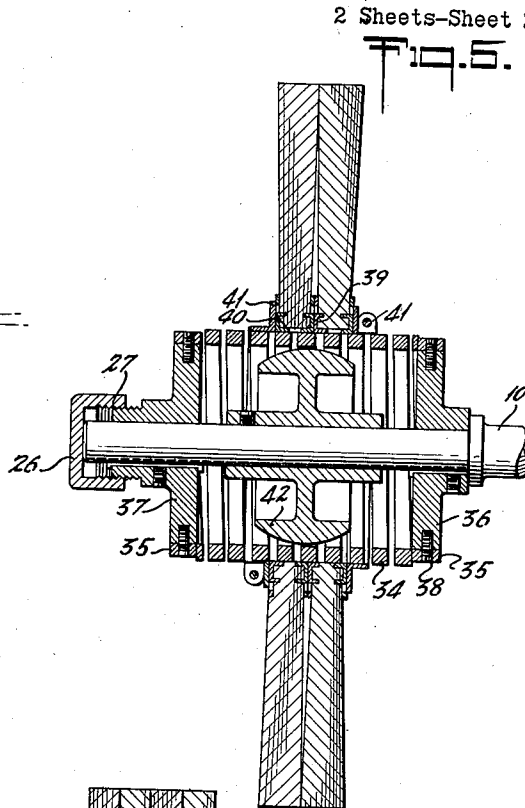
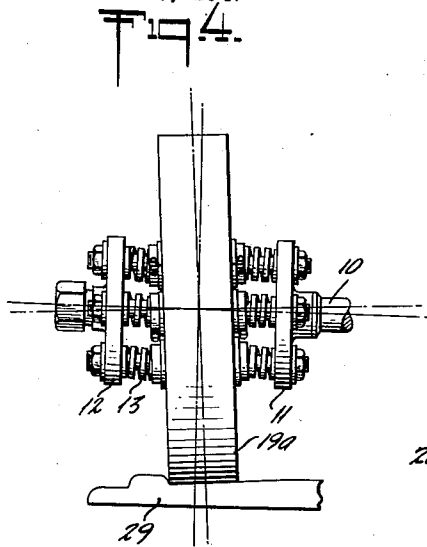
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2,537,792

ROTARY PROCESSING APPARATUS

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Application November 26, 1947, Serial No. 788,187

4 Claims. (Cl. 51-168)

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The present invention pertains to improvements in rotary processing apparatus.

An object of the invention is to provide resilient mounting means for rotary processing members such as buffing wheels and the like.

A further object is to provide mounting means of the above nature adapted to permit angular shifting of a rotary buffer to follow irregular contours of objects being processed.

Another object is to provide means to guide and regulate the angle of shift of the buffer and the degree of flexing of the mounting means.

A still further object is to provide means by which the normally flexible mounting means may be rendered rigid when desired.

Other objects and advantages of the invention will become evident during the course of the following description in conjunction with the accompanying drawings, in which

Figure 1 is a longitudinal sectional view of one form of the invention;

Figure 2 is a cross sectional view of the same in the plane 2-2, Figure 1;

Figure 3 is a detail view of a typical formed guide rod;

Figure 4 illustrates the angular flexing of the device to follow the contour of a surface being buffed;

Figure 5 is a longitudinal sectional view of a modified form of the invention;

Figure 6 is a similar view of a third embodiment, and

Figure 7 is a similar view of the third form illustrating the application of end plates to render the mounting rigid.

Referring to Figures 1 and 2, the numeral 10 designates a buffer spindle on which are mounted inner and outer hub plates 11 and 12 respectively. A plurality of longitudinal cylindrical springs 13, preferably made of rectangular stock as illustrated, are removably secured to the plates 11 and 12 in circumferentially spaced relation to form a mounting cage. The means of securing the springs to the plates may be by means of set screws 14 extending radially through terminal collars 15 welded to the ends of the springs, the inner ends of the set screws bearing on flanged bushings 16 disposed inside the collars 15. Rods 17, extending through the bushings 16 and retained by terminal nuts 18, brace the structure and may be dimensioned and formed to limit and guide the flexing of the springs 13 as hereinafter set forth.

The springs 13 are adapted to carry a plurality of adjacently disposed buffing sections 19 of any suitable type herein illustrated as of the annular fabric construction disclosed and claimed in copending application Serial Number 776,302, filed on September 26, 1947. Gripper rings 20 have extruded inner cylindrical portions, 21 adapted to embrace the springs 13, and also have axially directed points 22 for gripping the

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buffer sections 19 near the inner edges of the latter. Adjustable clamps 23 are provided to grip the springs 13 on both sides of the gang or assembly of buffer sections, thereby retaining the latter longitudinally and pressing them together as a unit.

The outer hub plate may be fitted with an inner key 24 engaging a key-way 25 in the shaft 10. A cap 26, threaded on the outer end 27 of the hub plate member 12, engages the end of the shaft or spindle 10.

In assembling the buffer sections on the supporting cage, they are first placed on the springs 13 in the general position shown in Figure 1, but with the rods 17 mounted loosely to allow longitudinal movement. The cap 26 may then be turned on the hub end 27, thus drawing the plate 12 outward after the manner of a wheel-puller and thereby stretching the springs 13 to a greater extent than it is desired to have them tensed when the device is in operation. The buffer sections with their retaining structures are next pressed together and the clamps 23 are tightened to grip the springs. The shaft cap 26 is then retracted, allowing the springs 13 to contract to the tension desired in operation. The contraction of the springs between opposing clamps 23 tends to draw the latter toward each other, thus pressing the buffer sections and their gripper rings more tightly together. At the same time the longitudinal contraction of the springs 13 causes a slight increase in their outer diameters, thereby further tightening the grip of the clamps 23 and assuring proper retention of the buffer gang in position during operation. The hub plate 12 is then locked to the spindle 10 by means of a set screw 28 and the rods 17 are secured tightly in place.

Figure 4 illustrates the manner in which the flexible mounting permits the assembly 19a of buffers 19 to swing laterally to follow angular surfaces on a work-piece 29. With ordinary rigid mounting such contours must be followed either by forcing the buffer itself to yield, which is destructive to the buffer and produces irregular work, or by swinging the work itself to accommodate the rigidly mounted buff, which latter proceeding is laborious and often impractical in the case of large work-pieces such as automobile bumpers.

For certain classes of work wherein it is desired to provide rigid radial backing for the buffer assembly while permitting angular flexing, rods 17a, interchangeable with the straight rods 17, may be made with various guiding surfaces such as that illustrated in Figure 3. In the latter figure the central portions 30 of the rods 17a are enlarged to substantially the interior diameter of the springs 13, the profiles 31 of the central portions 30 comprising circular arcs with their center 32 in the axis 33 of the driving spindle. It will be evident that when such rods are used, the

flexing of the buffer sub-assembly is guided spherically after the manner of a universal joint, while radial yielding of the mounting is restrained. Similarly, various degrees and types of restraint and guidance may be provided by interchangeable rods of suitable size and contour, the extreme condition being in which it may be desired to render the mounting substantially rigid. In the latter case the rods may have cylindrical central portions fitting the interiors of the springs 13.

Figure 5 illustrates a modification in which a single large cylindrical spring 34 forms the resilient mounting for the buffer sections 19 instead of the previously described cage springs 13. In this modification the welded end rings 35 of the spring 34 are secured directly to the hub plates 36 and 37 by means of screws 33. The gripper rings 39 are formed with extruded cylindrical internal rims 40 embracing the exterior of the drum spring 34, and the end clamps 41 are adapted to press the buffer sections together as previously described. In the manner also previously described, the spring drum may be stretched by means of the screw cap 26 to permit easy initial location of the buffer gang, after which partial retraction of the cap causes longitudinal contraction and diametral expansion to tighten the clamping of the buffer gang thereon. It will be noted that in installing or removing the buffer gang from the mounting means shown in Figure 5, it is unnecessary to remove the plate 37 or any other part of the mounting means, thus providing for quick and easy interchangeability of buffer sections or gangs.

A central guiding and limiting member 42 of any desired shape but herein illustrated as of spherical exterior contour, may be secured on the spindle 10 within the drum-spring 34. The member 42 is adapted to guide and limit the flexing of the mounting means in the same manner as explained with respect to the rods 17a, Figure 3.

Figure 6 illustrates a type of flexible buffer in which the yielding quality is embodied in central discs forming individual radial supports for the buffer sections. In this embodiment each multi-layered outer buffing annulus 43 has secured therein by sewing or the like a disc 44 of rubber or other suitable resilient material. The discs 44 are bonded to central bushings 45 of rigid material fitting on the driving spindle 46. The bushings 45 have forward external tapers 47 and corresponding rear internal tapered surfaces 48.

In assembly a plurality of the buffer sections are placed together on the spindle 46, the bushings 45 being clamped together in nested driving relation between a nut 49 and an externally tapered driving hub 50.

In the described assembly shown in Figure 5 the resilient supporting discs 44 supply the yield necessary to allow the outer annular buffer portions 43 to follow irregularities in the work surfaces for certain types of service. This action enables the fabric annular portions to be made relatively dense and relieves them of the necessity for destructive spreading and yielding among the individual layers of the sections. When it is desired to convert this type to a rigidly mounted type for buffing surfaces having no irregularities requiring flexibility, the assembly may be clamped between removable end plates 51 and 52 disposed on the spindle 46 behind the nut 49 and the driving hub 50 respectively, as shown in Figure 7.

While the invention has been described in pre-

ferred form, it is not limited to the exact structures illustrated, as various changes and modifications can be made without departing from the scope of the appended claims.

What is claimed is:

1. In a device of the character described, in combination, a rotary shaft, a plurality of annular buffing members, a plurality of circumferentially spaced and separated hollow cylindrical mounting means secured to said shaft and supporting said annular members, said mounting means being of resilient structure adapted to permit angular tipping of said annular members as a unit with respect to the axis of said shaft, means including clamps individually embracing each of said cylindrical mounting means to secure said annular members to said mounting means, and rigid means to limit radial flexing of said resilient mounting means.

2. In a rotary processing device, in combination, a rotary spindle, flexible mounting means secured to said shaft and including adjustable longitudinal helical spring means adapted to normally support a rotary processing member in concentric relation with said shaft and means to lock said member to said helical spring means, said spring means being flexible to permit angular tipping of said rotary processing member as a unit with respect to the axis of said shaft.

3. In a device of the character described, in combination, a rotary shaft, a cage comprising a pair of spaced plates secured to said shaft and a plurality of longitudinal helical springs terminally secured to said plates in circumferentially spaced and separated relation, rigid rods extending through the interiors of said springs and secured to said plates, and means to secure a plurality of rotary buffing sections to said springs.

4. In a device of the character described, in combination, a rotary shaft, a cage comprising a pair of spaced plates secured to said shaft and a plurality of longitudinal helical springs terminally secured to said plates in circumferentially spaced and separated relation, rigid rods extending through the interiors of said spring and secured to said plates, and means to secure a plurality of rotary buffing sections to said springs, said rods having shaped central portions adapted to engage the interior surfaces of said springs to guide and control lateral flexing of said springs.

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