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FASTENING MEANS FOR ROLL CUTTING MACHINE ASSEMBLY

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Fig.2

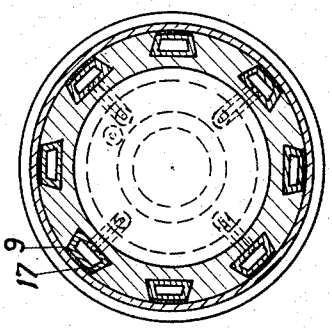


Fig.1

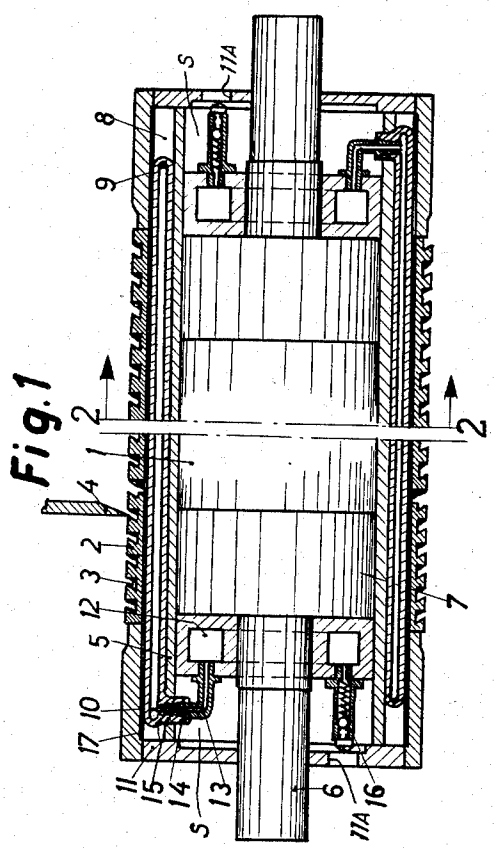
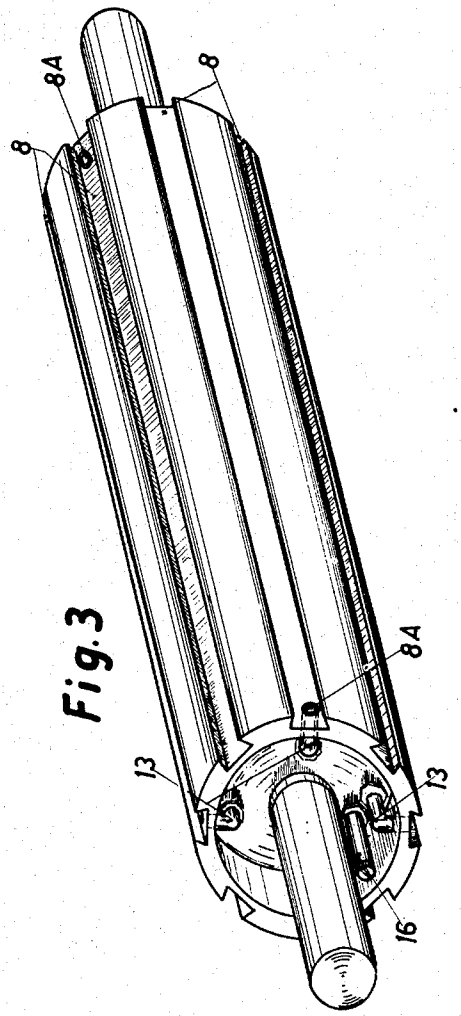


Fig.3



Inventors
M. Schneider
E. J. Kusel
By Glascock Downing & Seibold
Attys.

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FASTENING MEANS FOR ROLL CUTTING MACHINE ASSEMBLY

Max Schneider, Dusseldorf, and Ernst Kusel, Dusseldorf-Lohausen, Germany, assignors to Jagenberg-Werke Akt.-Ges., Dusseldorf, Germany

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6 Claims. (Cl. 164—70)

The present invention relates to fastening means for the cutting boxes on cylinders of roll cutting machines of the type wherein a web of material to be cut is fed through a cutting assembly comprising an axle provided with adjustable circular knives and a counter-knife cylinder, on which cylinder is arranged a plurality of axially displaceable and lockable grooved cutting boxes.

The fastening of such boxes on the cylinder has always presented problems in situations where mechanical means have been employed, since, if it is necessary to change to a different cutting division, the cutting tools must be loosened independently of each other, set and thereafter re-locked. To offset such disadvantages, it has been proposed to incorporate in the cutting tools and/or the cylinder supporting the tools, elements which will expand when subjected to the action of compressed air or the like thereby effecting a connection between the cutting tool and the cylinder. With this type of fastening means, it is necessary to employ a plurality of expansible elements which are embedded within the peripheral surface of the cylinder and are connected to a source of compressed air.

In such fastening system, each of the expansible elements is dependent upon the other elements for the proper functioning thereof, and, if one of the elements should lose its sealing effect due to age or damage, the other elements become ineffective. This defect not only results in stoppages, but, causes injury to the circular knives and a considerable wastage of the material being processed.

Accordingly, a salient object of the present invention is to overcome the above and other objectionable features now existing in the art.

Broadly, to accomplish the desired ends, the invention comprises the use of a plurality of expansible elements intermediate the cylinder and the cutting means with the expansible elements connected in groups to separate sources of compressed air or similar medium so that if one of the expansible elements should lose its sealing effect, the elements of the other group remain operative thus holding the cutting means sufficiently secure on the cylinder to permit efficient operation of the cutting assembly.

More specifically, the expansible elements are spaced apart uniformly about the entire periphery of the cylinder and extend longitudinally thereof, an air distribution chamber is provided at each end of the cylinder, with each chamber receiving air from a separate source and a connection between one end of each of the expansible elements and one of the chambers. The connections between the expansible elements and the distribution chambers are such that the elements communicate alternately with the respective chambers thereby providing two groups of expansible elements with each group being in communication with a separate source of air.

The expansible elements are each defined by a body having a trapezoidal cross-section with each of the bodies lodged in a groove of a corresponding cross-section

formed in the cylinder to assure a safe guiding and securing of the elements in the cylinder.

From a study of the following description, further objects and advantages of the invention will become more fully apparent to persons skilled in the art.

With the foregoing and other important objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully described.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application, wherein like numerals indicate the same or similar parts in the several views and in which:

Figure 1 is a longitudinal sectional view of a cylinder providing the support for the cutting means and equipped with the present invention.

Figure 2 is a cross-sectional view taken along the line 2—2 of Figure 1, the view looking in the direction of the arrows, and,

Figure 3 is a perspective view of the cylinder with the cutting means and expansible elements removed.

As shown in Figure 1, a cylinder denoted generally at **1** supports a number of cutting members or boxes **2** provided with a groove **3** and the cutting edges defined with the groove cooperate with circular knives **4**, only one of which is shown. The knives **4** correspond in number to the respective number of cutting points on the cylinder to cut the web passing between the cutting members **2** and the knives **4** into the desired strips.

The cylinder **1** comprises a jacket or shell **5** and a wall **7** having an axle **6** extending perpendicularly therefrom is inserted into the jacket at each end thereof. It will be noted that the walls **7** are disposed inwardly of the respective ends of the jacket **5** so as to define a space between the wall and the end of the jacket and the function of such spaces indicated S will later be more fully described.

The wall of the jacket **5** is formed with a series of equally spaced apart dovetail grooves or slots **8** which extend longitudinally of the jacket from one end to the other end. While there has been illustrated the use of eight such grooves, it is to be understood that a more or lesser number may be used. Each groove in the jacket **5** receives a tubular expansible element **9** having a trapezoidal cross-section (Figure 2) or a cross-section corresponding to that of the groove. One end of each element **9** is provided with an opening **10** while the other end is closed.

It can be seen that the bottom of each groove **8** adjacent one end of the jacket **5** is formed with an aperture **8A** and the apertures are located alternately at opposite ends of the jacket. In other words, four of the grooves have apertures at one end with the other four grooves provided with the apertures at the opposite ends thus affording two groups of grooves. Each groove **8** receives the expansible element **9** with the openings **10** thereof in registry with the respective apertures **8A**. Hence, the openings **10** are located alternately at the opposite ends of the jacket about the entire periphery of the jacket.

As previously mentioned, a space S is formed at each end of the jacket between the walls **7** and the respective ends of the jacket and an annular distributing chamber **12** is disposed adjacent each wall **7** inwardly of an end cover plate **11** suitably connected to the cylinder. An L-fitting **13** communicates at one end with the interior of the distributing chamber **12** and is attached at its other end by a sleeve-like piece **14** to a correspondingly shaped end **15** surrounding the opening **10** of the expansible element **9**, the end **15** projecting through the aperture **8A** of the jacket.

Each of the distributing chambers is provided with a compressed air connection **16**, in the nature of a relief

valve and to permit compressed air to be introduced into the chambers through the connections, an opening 11A is formed in each end cover plate in proximity to the outer end of the associated connection 16. Hence, a conduit or other convenient means can be attached to each connection 16 with the other end of the conduit leading to a source of compressed air.

In order to prevent the upper face of each of the expansible elements directly engaging the cutting means 2, a covering member 17 is loosely inserted in each groove between the element 9 and the cutting means 2. To prevent axial displacement of the covering members, it will be noted that ends of the covering members contact the end cover plates 11.

From the foregoing description, it is believed that the operation of the assembly is obvious and that when air is introduced into the chambers 12, the elements 9 will be expanded by virtue of the connections 13 between the chambers and the individual expansible elements. By reason of the separate air supplies, if one of the elements 9 should be defective, the other elements will continue to function so that operation of the assembly is not impaired.

In addition, after the removal of the cover plate 11, it is possible to remove and replace each of the expansible elements 9 independently without the necessity of removing the cutting means 2 from the cylinder or dismantling the entire cylinder assembly.

The securing means is quite simple structurally, positive and efficient in operation and can be manufactured at a reasonable cost. Also, the assembly can be incorporated with conventional equipment with a minimum of modification of such equipment.

It is to be understood that the invention is not to be confined to any strict conformity with the showing in the drawings but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

Having thus shown and described the preferred embodiment of the invention, we claim as novel, the following:

1. In a roll cutting machine of the type wherein cutting surfaces are supported by a cylinder for coaction with circular knives to cut a web, means for securing the cutting surfaces to the cylinder, such securing means including means defining longitudinally extending grooves spaced about the cylinder, an expansible element lodged in each groove cooperable with the cutting surfaces upon expansion to secure such surfaces to the cylinder, a separate compressed air source within the cylinder at each end thereof, and means alternately connecting the expansible elements with the separate compressed air sources to provide two groups of expansible elements supplied by separate air sources.

2. The securing means defined in claim 1 in which the longitudinal grooves have a dovetail cross-section and the expansible elements have a trapezoidal cross-section.

3. The securing means defined in claim 2 in which the compressed air source is a distribution chamber provided with a connection in communication with compressed air.

4. The securing means defined in claim 1 in which a covering is positioned in each groove between the expansible element and the cutting surfaces to prevent direct engagement between the said element and the cutting surfaces.

5. In a roll cutting machine of the type wherein cutting surfaces are supported by a cylinder for coaction with circular knives to cut a web, means for securing the cutting surfaces to the cylinder, such securing means including a plurality of longitudinally extending expansible elements supported at spaced intervals about the periphery of the cylinder cooperable upon expansion with the cutting surfaces to secure the cutting surfaces to the cylinder, at least two separate compressed air sources within the cylinder, and means connecting certain of the expansible elements with one air source and the remaining expansible elements with the other air source.

6. In a roll cutting machine of the type wherein cutting surfaces are supported by a cylinder for coaction with circular knives to cut a web, means for securing the cutting surface to the cylinder, such securing means including means defining longitudinally extending dovetail slots spaced at equal intervals about the cylinder periphery, an expansible element of trapezoidal cross-section lodged in each slot cooperable upon expansion with the cutting surfaces to secure such surfaces to the cylinder, an air distribution chamber within the cylinder adjacent each end thereof, a connection coupling a source of compressed air with the respective chambers, an air inlet for each expansible element with such inlets being alternately located at opposite ends of the cylinder, and connections between each distribution chamber and each inlet whereby certain of the expansible elements communicate with one chamber and the remaining elements with the other chamber.

References Cited in the file of this patent

UNITED STATES PATENTS

654,248	Hager	July 24, 1900
725,971	Kling	Apr. 21, 1903