March 3, 1931. D. R. HAUCK 1,794,896

FLEXIBLE ROLLER

Filed Nov. 22, 1929 2 Sheets-Sheet 1

Fig. 1.

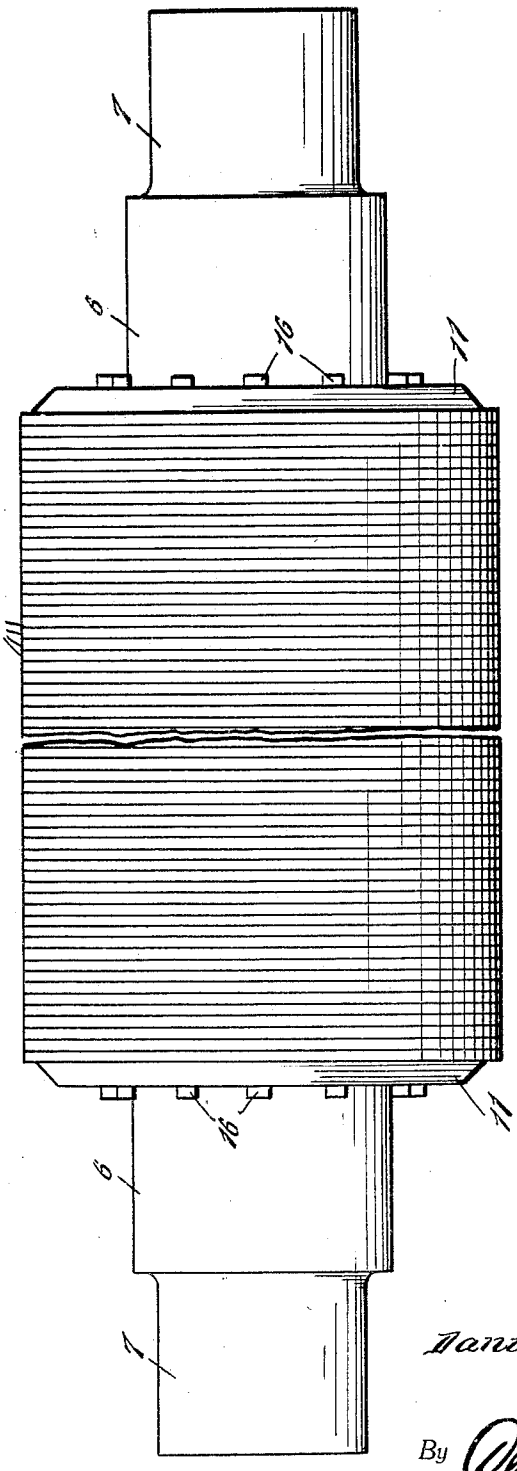
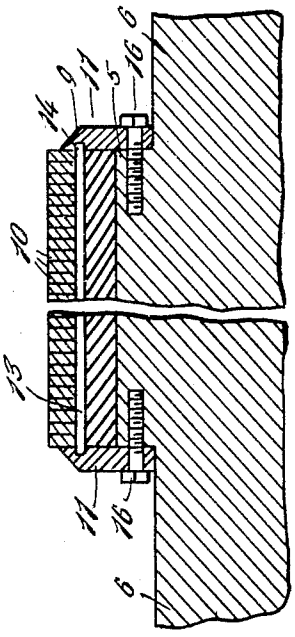


Fig. 2.



Inventor

Daniel R. Hauck

By Clarence A. O'Brien

Attorney

March 3, 1931. D. R. HAUCK 1,794,896

FLEXIBLE ROLLER

Filed Nov. 22, 1929 2 Sheets-Sheet 2

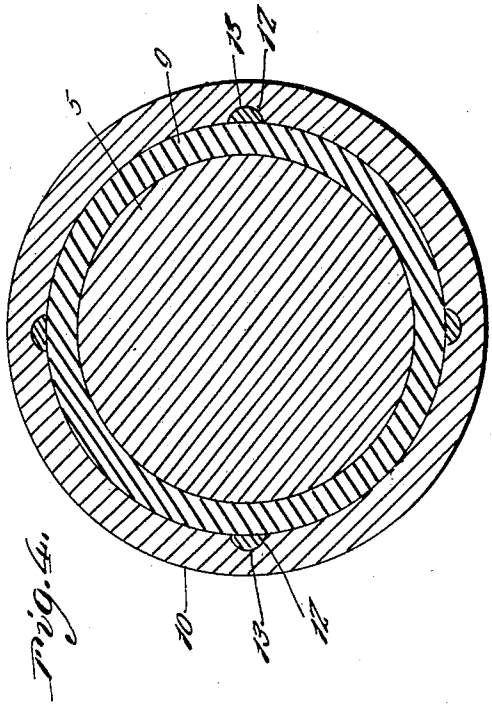


Fig. 4.

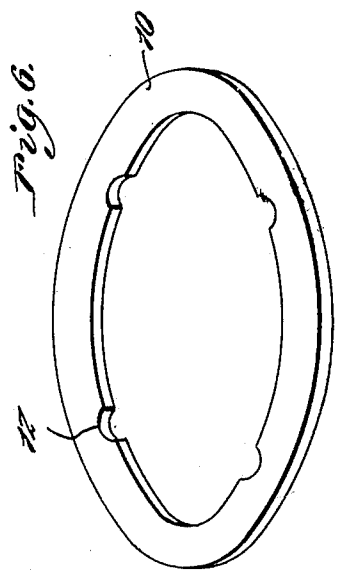


Fig. 6.

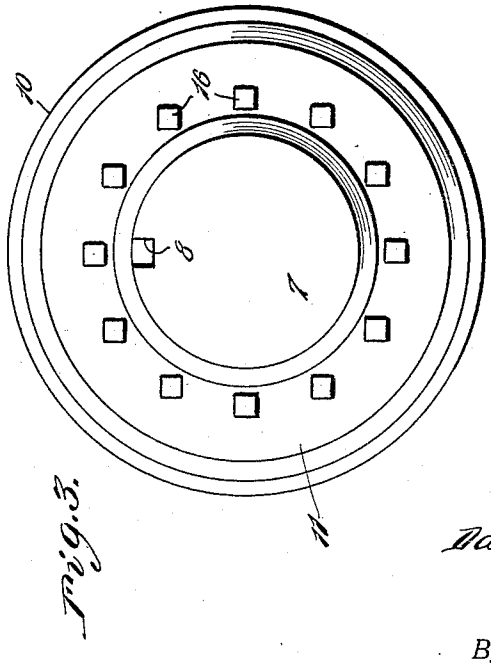


Fig. 3.

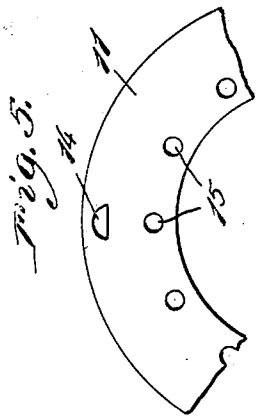


Fig. 5.

Inventor

Daniel R. Hauck

By Clarence A. O'Brien

Attorney

Patented Mar. 3, 1931 1,794,896

UNITED STATES PATENT OFFICE

DANIEL R. HAUCK, OF AKRON, OHIO

FLEXIBLE ROLLER

Application filed November 22, 1929. Serial No. 409,025.

The application of a skin coat of rubber, paint, or any other plastic compound or substance on cord or close woven cotton fabric or similar material, is accomplished by passing the fabric through two rolls one of which is provided with a thin wall of compound to be applied to the fabric, and the pressure necessary for this application of the compound to the fabric is produced through the medium of a third roller as is well known in the art. Through the medium of feeding the compound between this third roller and the said one roller of the first mentioned pair of rollers at the same time the fabric or other material is passed between said pair of rollers, and through the application of proper pressure, a skin coat of the compound will be readily picked up by the fabric or other material passing between said pair of rollers and thus the material will be coated with the thin layer of the compound such as rubber, paint or other plastic substance.

The chief function of said third roller which is termed the cushion or flexible roller is to allow the passing of the fabric or material of varying gauge (within a tolerance of from .001 to .005 inches) without crushing or distorting the fabric, yet at the same time having sufficient pressure to apply the coat properly and in the manner above referred to.

From the foregoing it will be seen that the third roller must be flexible, yet at the same time of sufficient strength as to be capable of supplying the needed pressure for applying a thin coat of rubber, paint or other plastic compound or substance on cord or close woven cotton fabric as in the production of rubber tires, other rubberized goods, oil cloths and the like, and such can be accomplished without crushing or distorting the fabric to be coated.

It is, therefore, the primary object of the present invention to provide a third or cushion roller which will be fully capable for fulfilling the essential of a third roller as are used for this purpose and which roller will possess certain other highly desirable qualities as to render the same capable of carrying out these necessary qualities in a manner much more efficient than has heretofore been accomplished.

The above and other objects and advantages of the invention will be apparent from a study of the following description, taken in connection with the accompanying drawings, wherein:—

Figure 1 is a side elevation of a flexible or cushion roller embodying the features of my invention.

Figure 2 is a fragmentary detail sectional view thereof.

Figure 3 is an end view thereof.

Figure 4 is a transverse sectional view therethrough.

Figure 5 is a fragmentary detail elevational view of one of the clamping discs.

Figure 6 is a perspective view of one of the steel rings forming the surface of the flexible roller.

With reference more in detail to the drawings, it will be seen that my invention comprises a core 5 formed at opposite ends thereof with reduced end portions 6 forming journals, which journals 6 in turn terminate in reduced terminals 7, and as shown to advantage in Figure 3, these end projections 7 are provided with suitable keyways 8 whereby ball gears (not shown), for grinding the roller may be keyed to said projections. Arranged on the core 5 as shown to advantage in Figure 2 is a sleeve 9 of a length corresponding to the length of the core 5, and this sleeve 9 is formed of any suitable compound and which sleeve 9 may be of any thickness of depth as to fit beneath for which the roller is intended. Arranged on the sleeve 9 is a series of metallic discs or rings 10 forming the outer or contacting surface of the flexible roller. These metallic rings or discs 10 have an interior diameter corresponding to the exterior diameter of the sleeve 9 and may be slipped upon to be arranged thereon in end to end relation, the rings 10 being sufficient in number as to extend from one end to the other of the roll as shown to advantage in Figure 2.

At each end of the core 5 and disposed thereagainst are clamping rings 11—11, which clamping rings are mounted on the

journals 6 and bear against the end of the sleeve 9 and the rings 10 on the ends of the core through the medium of which clamping rings the series of rings or discs 10 will be clamped axially together on the sleeve of the core.

To prevent creasing of the rings or discs 10 on the core 5, said rings on their inner periphery are provided with a plurality of circumferentially spaced notches 12 preferably of the shape shown in Figure 6. These notches 12 provide seats for elongated locking bars 13, which bars 13 in cross section are of a shape corresponding to the shape of the notches 12. These locking bars 13 fit in the notches or seats 12 and extend longitudinally across the outer face of the sleeve 9 as shown to advantage in Figure 4. The ends of the lock bars 13 are receivable in suitably shaped recesses or sockets 14 formed on the inner ends or faces of the clamping rings 11 as shown to advantage in Figure 2.

It is also to be noted that the clamping rings 11—11 adjacent their inner periphery are provided with a series of circumferentially spaced bolts 16 through which openings are passed headed bolts 17 are threaded into the core 5 for securing and retaining the clamping position as is also shown to advantage in Figure 2.

The retaining rods 13 arranged within the seats 12 will retain the rings 10 against relative displacement with respect to one another, and these members 13 having their ends receivable in the suitably formed openings 14 formed in the clamping rings 11 will also retain the said rings 10 against slippage or rotative movement relative to the composition sleeve 9 as is apparent.

The sleeve 9 is formed of a suitable composition designed to afford the necessary flexibility, and in view of the foregoing, it will be readily appreciated that a roller of this character will be barely strong enough to apply the necessary and desired pressure for accomplishing the purpose for which it is designed, and at the same time preventing crushing, distorting, cutting or otherwise rendering defective any and all material being so coated in machines for this purpose and equipped with a roller embodying the features of the present invention.

Even though I have herein shown and described the preferred embodiment of my invention, it is to be understood that the same is susceptible to some changes fully comprehended by the spirit of the invention as herein described, and the scope of the appended claims.

Having thus described my invention, what I wish to claim as new is:—

1. In a device of the character described, a roll comprising a core, a sleeve formed of yielding material mounted on the core, a series of metallic rings mounted on the sleeve and forming an outer surface for the roll, journals extending from opposite ends of the core, clamping rings mounted on said journals and engaging with the outermost rings of said series of rings, for clamping said series of rings axially of said core, bolts engaging said clamping rings and said core for retaining said last mentioned rings in clamping position, and means cooperating with said series of rings and said clamping rings for controlling the angular slippage of said rings relative to one another and to said sleeve.

2. In a device of the character described, a roll comprising a core, journals extending from opposite ends of said core, a sleeve formed of yielding material mounted on the core, a series of metallic rings mounted on the sleeve and forming an outer surface for the roll, clamping rings mounted on said journals, means for securing said clamping rings to said core for clamping said series of rings together axially of the core, said clamping rings engaging the adjacent ends of said sleeve and the outermost end ring of said series of rings, said clamping rings having a plurality of circumferentially spaced recesses formed on the inner opposed faces thereof, and a plurality of circumferentially spaced rods engaging with the rings of said series, said rods having their opposite ends receivable in the recesses formed in said clamping rings.

3. In a device of the character described, a roll comprising a core, journals extending from opposite ends of said core, a sleeve formed of yielding material mounted on the core, a series of metallic rings mounted on the sleeve and forming an outer surface for the roll, clamping rings mounted on said journals, means for securing said clamping rings to said core for clamping said series of rings together axially of the core, said clamping rings engaging the adjacent ends of said sleeve and the outermost end ring of said series of rings, said clamping rings having a plurality of circumferentially spaced recesses formed on the inner opposed faces thereof, and a plurality of circumferentially spaced rods engaging with the rings of said series, said rods having their opposite ends receivable in the recesses formed in said clamping rings, and the rings of said series having a plurality of circumferentially spaced seats formed on their inner periphery for reception of the adjacent portions of said rods.

In testimony whereof I affix my signature.

DANIEL R. HAUCK.