Aug. 10, 1948. A. J. CARPENTER, JR 2,446,690

SELF-LOCKING PAPER ROLL CHUCK

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Fig. 1.

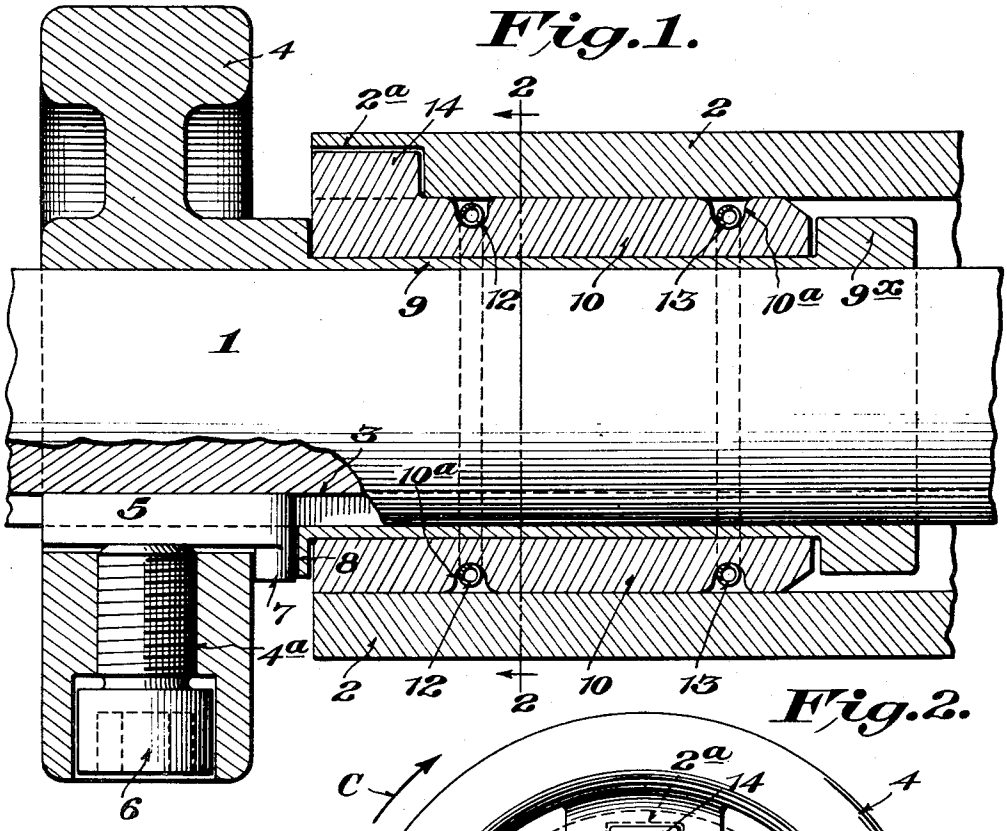


Fig. 2.

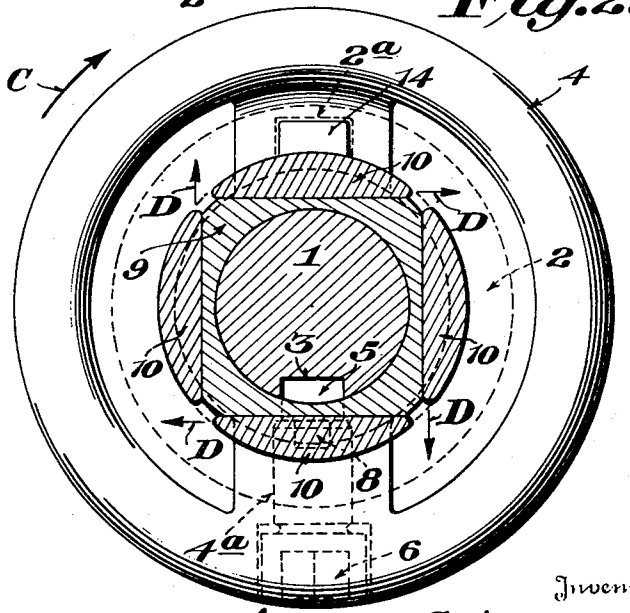


Fig. 3.

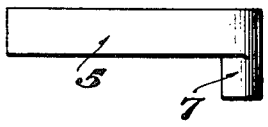
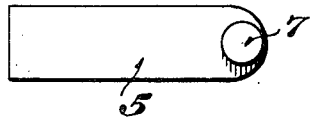


Fig. 4.



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Fig. 5.

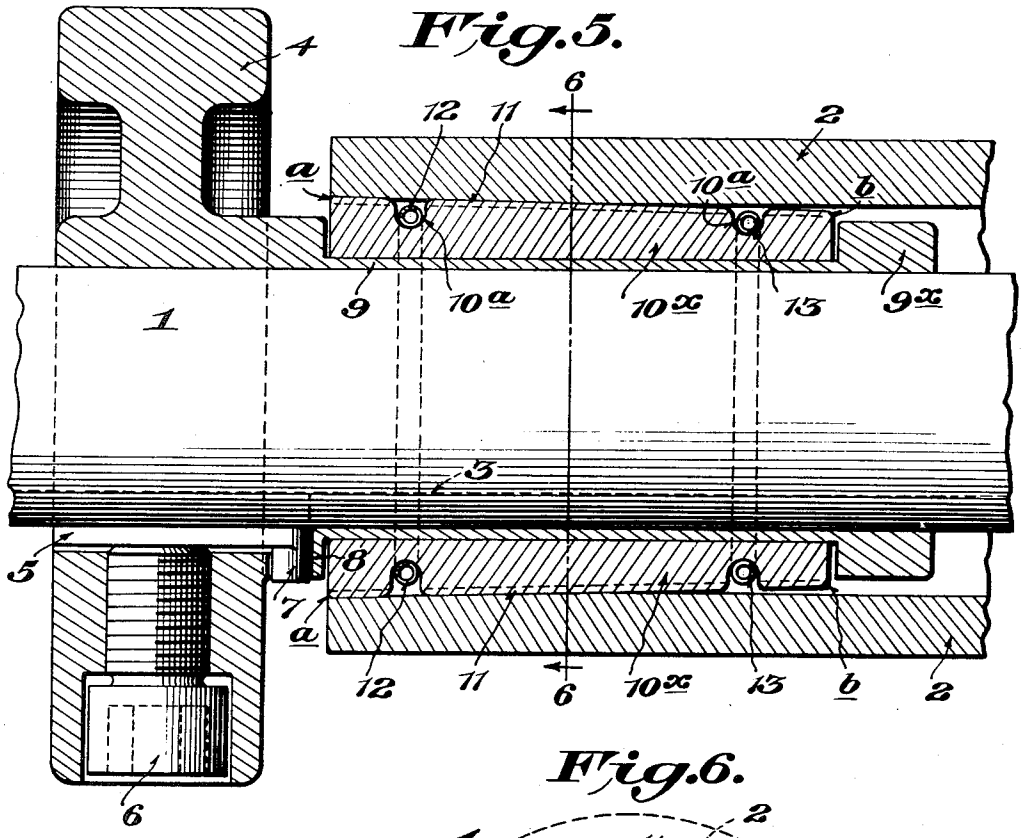
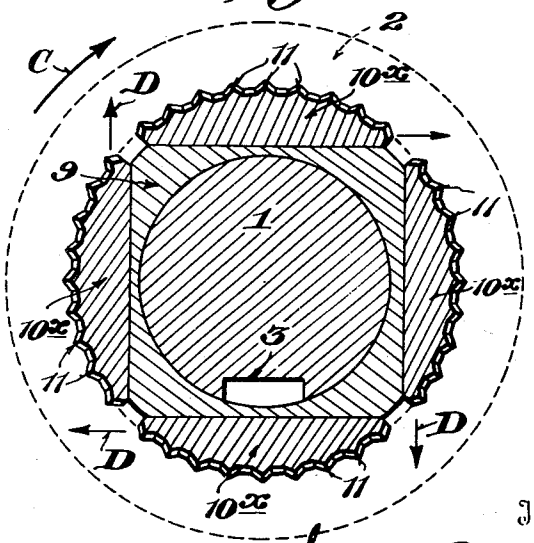


Fig. 6.



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SELF-LOCKING PAPER ROLL CHUCK

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Application March 15, 1944, Serial No. 526,613

12 Claims. (Cl. 242—68)

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This invention is a novel improvement in self-locking paper roll chucks, and the principal object thereof is to provide a novel chuck designed in one form to grip plain sulphite cores of paper rolls which have the same consistency throughout, and in another form designed to grip sulphite cores which have metallic ends, the two designs having common major parts which is to the advantage of the purchaser for the reason that if the purchaser has been using paper rolls having plain sulphite cores and later decides to use sulphite cores having metallic ends, it would merely become necessary to exchange certain parts of the chuck instead of having to replace the chuck in its entirety, thereby saving considerable monetary chuck investment.

Other objects of the invention are to provide a novel chuck which will be inexpensive and practical in operation and in which the complicated mechanism so often used in this type of chuck is eliminated, and which will accommodate the two different types of paper roll core now commonly used in the trade.

In the past years, attempts have been made to produce satisfactory paper roll chucks but in most instances the chucks have been of very complicated design, involving considerable expense in their manufacture; also involving a great deal of handling in operation.

I will explain my invention with reference to the accompanying drawings which illustrate several practical embodiments thereof to enable others familiar with the art to adopt and use the same; and will summarize in the claims the novel features of construction and novel combinations of parts for which protection is desired.

In said drawings:

Fig. 1 is a side view partly in section showing my novel chuck adapted to accommodate sulphite cores having metallic ends.

Fig. 2 is a transverse section on the line 2—2, Fig. 1.

Fig. 3 is a side elevation of the key.

Fig. 4 is a top plan view of the key shown in Fig. 3.

Fig. 5 is a side elevation partly in section, showing a modified chuck adapted to accommodate plain sulphite cores having no metallic ends.

Fig. 6 is a transverse section on the line 6—6, Fig. 5.

In Figs. 1–4 inclusive, the paper roll shaft is indicated at 1, while the metallic end of the paper roll core is indicated at 2, the core being

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provided with a keyway 2*a* for the purpose hereinafter set forth.

Shaft 1 is provided with a keyway 3 of appropriate length, and upon shaft 1 is mounted the stationary member 4 of the chuck which is rigidly held in position on shaft 1 by means of a key 5 (Figs. 3 and 4) slidable along keyway 3 and which key 5 engages a corresponding groove in the bore of chuck member 4, as indicated in Fig. 1. Key 5 is engaged by a set screw 6, preferably of the Allen type threaded into a tapped bore 4*a* in the member 4 to hold the chuck against axial movement on shaft 1. Key 5 also carries a lateral projection 7 which enters a corresponding hole 8 in stationary chuck member 4 so that for any axial adjustment of the chuck on shaft 1 the key 5 will retain its proper position relative to the member 4.

Extending laterally of the chuck member 4 is a hub portion 9 of polygonal exterior shape, same as shown in Fig. 2 being square. Seated upon the four faces of hub 9 are four segments 10, the outer faces of which segments 10 are arcuate so as to form a substantially cylindrical surface when so assembled. One of said segments 10 is provided with a tooth 14 adjacent the stationary chuck member 4 adapted to enter the keyway 2*a* in the end of the metallic paper roll core 2. The four segments 10 are yieldably retained in their relative positions on the hub 9 of the chuck between member 4 and an enlargement 9*x* at the opposite end of the hub by means of endless coil springs 12 and 13 seated in grooves 10*a* in the outer faces of the said segments.

In operation, assuming that the paper roll is revolving in the direction of the arrow C, Fig. 2, a drag on paper roll shaft 1 is set up due to the braking action of the usual tensioning mechanism (not shown) at one end of the paper roll shaft, and due to such drag the segments 10 will respectively be forced in the direction of the arrows D (Fig. 2) and will thus be forced into firm contact with, and thus to bite into, the inner surface of the paper roll sulphite cores adjacent the metallic ends.

In the modification shown in Figs. 5 and 6, like parts are similarly lettered. In this modification the chuck is adapted to accommodate or grip plain sulphite cores having the same consistency throughout. As shown, the outer surfaces of the assembled segments 10*x* are slightly cone-shaped, tapering from a major diameter at *a* to a minor diameter at *b*. The outer surfaces of the segments 10*x* are provided with a series of longitudinal parallel ribs or projections 11

adapted to bite into the sulphite paper roll core 2. The segments 10x are also retained in their respective positions on the hub 9 of the chuck by means of continuous coil springs 12 and 13.

In this modification, assuming that the roll is revolving in the direction of the arrow C (Fig. 6) a drag on the paper roll shaft 1 will be set up, due to the braking action of the usual tensioning mechanism (not shown) at an end of the paper roll shaft, and thus the segments 10x will be respectively forced in the direction of the arrows D and will thus bite into the inner surface of the paper sulphite core 2.

My novel chucks provide an inexpensive and practical means for chucking a paper roll, and one that can accommodate the two different types of paper roll cores now commonly used in the art. The chucks, above described, thus provide a simple and efficient design which will accommodate or grip sulphite cores having the same consistency throughout as in Figs. 5–6 and which with simple replacement of segments 10 or 10x will accommodate sulphite cores having metallic ends as in Figs 1–2, which feature is very valuable from the standpoint of the purchaser, for if the purchaser should be using plain sulphite cores in paper roll chucks and later decides to use sulphite cores having metallic ends, it is merely necessary for him to exchange the segments 10 or 10x from one type to the other, instead of having to exchange the chuck in its entirety, thus saving considerable expense in chuck investment. Moreover, in my chuck the usual complicated mechanism is eliminated.

I do not limit my invention to the exact forms shown in the drawings, for obviously changes may be made therein within the scope of the claims.

I claim:

1. In combination, a shaft, a paper roll having a core on said shaft, a self-locking chuck comprising a member on said shaft adjacent an end of said core and having a bore receiving said shaft, means for locking the member in adjusted position on said shaft, said member having a hub extension entering the end of the core, said extension being polygonal in external shape, segmental plates seated on the respective polygonal faces of the hub extension, the outer surfaces of the segmental plates when assembled forming a substantially cylindrical surface contacting the inner walls of the cores, and means for yieldably maintaining the segments in position on the faces of the hub extension, whereby as the web is unwound from the roll any drag on the shaft will shift the segmental plates laterally on their related faces of the hub and into forced contact with the inner wall of the core; said core having a metallic end provided with a keyway, and one of said segmental plates having a tooth at its end adjacent the member engaging the said keyway.

2. In combination, a shaft having a keyway, a paper roll core on said shaft, a self-locking chuck comprising a member on said shaft adjacent an end of said core and having a bore receiving said shaft, a key within said bore engaging said keyway, means for locking the member in adjusted position on said shaft, said member having a hub extension entering the end of the core, said extension being polygonal in external shape, segmental plates seated on the respective polygonal faces of the hub extension and having aligned transverse grooves in their

outer faces, the outer surfaces of the segmental plates when assembled forming a substantially cylindrical surface contacting the inner wall of the core, and an endless coil spring in said aligned grooves around the segmental plates yieldably maintaining the plates in position on the faces of the hub extension, whereby as the roll is unwound from the core any drag on the shaft will shift the segmental plates laterally on their related faces of the hub and into forced contact with the inner wall of the core.

3. In a combination as set forth in claim 2, said key having a lateral projection entering a hole in the bore of the member, whereby the key will be moved with said member axially of shaft when the member is moved.

4. In a combination as set forth in claim 2, said locking means comprising a set screw engaging the key through a tapped bore in the member, whereby when the set screw is tightened the key will frictionally bind in the keyway.

5. In a combination as set forth in claim 2, the outer faces of said assembled segmental plates being cone-shaped, with the major diameter of the cone adjacent said member.

6. In a combination as set forth in claim 2, said outer faces of the segmental plates being provided with parallel longitudinal ribs.

7. In a combination as set forth in claim 2, said core having a metallic end provided with a keyway, and one of said segmental plates having a tooth at its end adjacent the member engaging the said keyway.

8. A self-locking chuck comprising a member having a bore; said member having a hub extension polygonal in external shape and having a head at its outer end; segmental plates seated on the respective polygonal faces of the hub extension between the member and head and adapted to shift laterally of said faces; the outer surfaces of the segmental plates when assembled forming a substantially cylindrical surface; and means yieldably maintaining the segmental plates in position on the faces of the hub extension; one of said segmental plates having a tooth at its end adjacent the member.

9. In combination, a shaft having a keyway, a paper roll core on said shaft, a chuck comprising a member on said shaft adjacent an end of said core and having a bore receiving said shaft; a key within said bore carried by the member and engaging said keyway; said key having a lateral projection entering a hole in the bore of the member whereby the key will be moved with the member axially of shaft when the member is moved; means for locking the member in adjusted position on said shaft; and said member having a hub extension entering the end of the core for engaging the inner wall thereof and tightly gripping same when said core is rotated relative to the shaft.

10. In combination, a shaft having a keyway, a paper roll core on said shaft, a self-locking chuck comprising a member on said shaft adjacent an end of said core and having a bore receiving said shaft, a key within said bore carried by the member; means for locking the member in adjusted position on said shaft, said member having a hub extension entering the end of the core, said extension being polygonal in external shape and having a head at its end within the bore; segmental plates seated on the respective polygonal faces of the hub extension between the member and head and having

aligned transverse grooves in their outer faces, the outer surfaces of the segmental plates when assembled forming a substantially cylindrical surface contacting the inner wall of the core, and endless coil springs in said aligned grooves around the segmental plates yieldably maintaining the plates in position on the faces of the hub extension whereby as the roll is unwound from the core any drag on the shaft will shift the segmental plates laterally on their related faces of the hub and into forced contact with the inner wall of the core.

11. In a combination as set forth in claim 10, the outer faces of said assembled segmental plates being cone-shaped, with the major diameter of the cone adjacent said member.

12. In a combination as set forth in claim 10, said core having a metallic end provided with a keyway, and one of said segmental plates having a tooth at its end adjacent the member engaging the said keyway.

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