

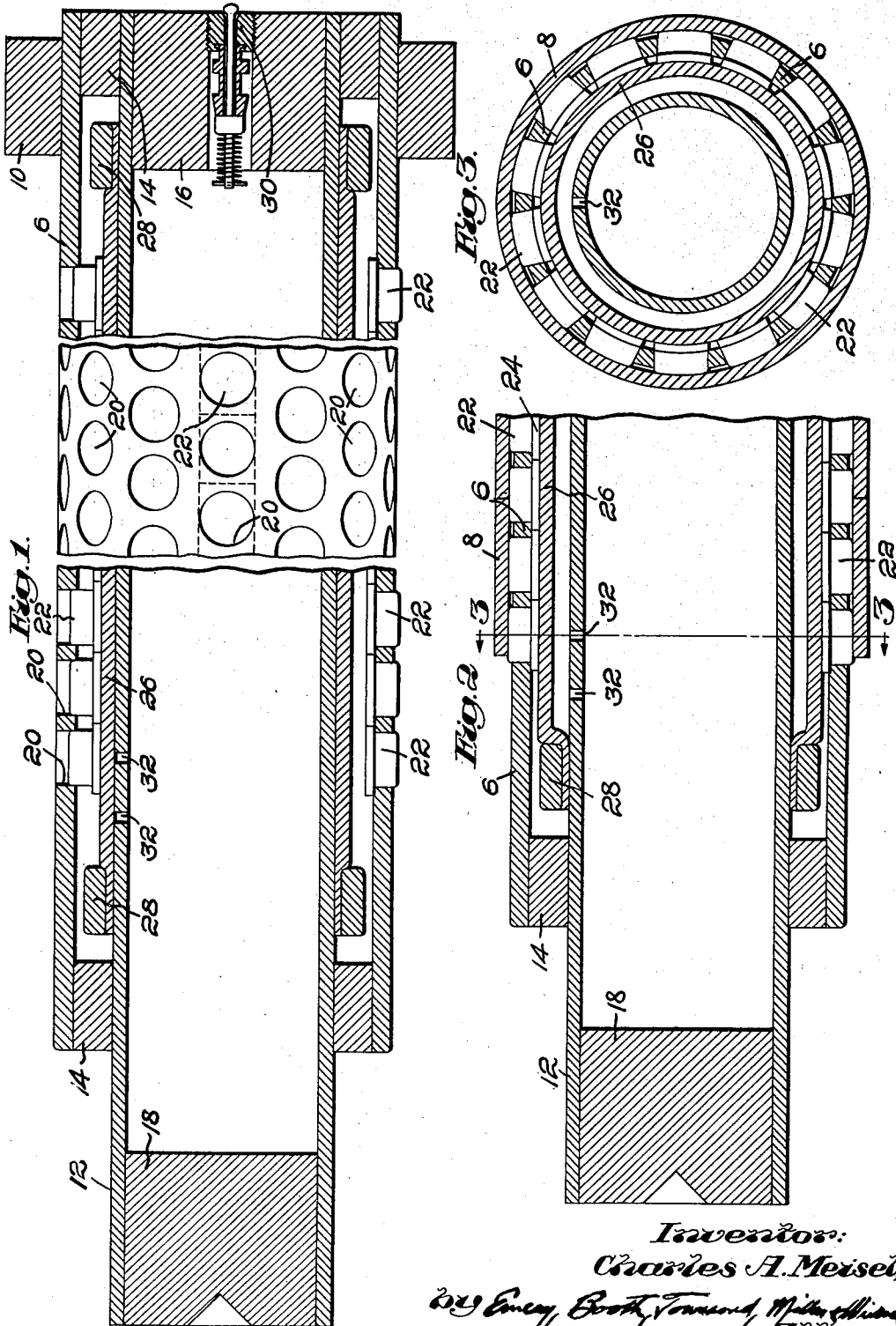
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ROLL SPINDLE

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ROLL SPINDLE

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4 Claims. (Cl. 242—72)

This invention relates to spindles for rolls and the object is to provide a support for a roll or for the core on which a roll of paper or fabric is usually wound adapted to engage the same with a uniform grip in accurately centered position. My invention will be well understood by reference to the following description taken in connection with the accompanying drawing, wherein I have shown by way of example one illustrative embodiment of my invention as applied to a rewinding roll for a paper web and wherein:

Fig. 1 is a broken view partly in elevation and partly in central vertical section showing a roll spindle illustrative of my invention;

Fig. 2 is a fragmentary view in vertical section showing roll-supporting cores engaged with the spindle; and

Fig. 3 is a section on the line 3—3 of Fig. 2.

Referring to the drawing, the spindle there shown embodies an outer shell 6 adapted to receive a core 8 (Fig. 3) on which a roll of paper is to be wound. In Fig. 1 I have shown the right-hand end of the spindle as supported in a bearing 10 while from the other end thereof projects a trunnion, herein formed by the projecting end of an inner shell 12 supported within the shell 6 by rings 14 and closed at the ends by the plugs 16 and 18.

The core 8, which, as seen in Figs. 2 and 3, is slightly greater in internal diameter than shell 6 in order to permit it to be slipped on and off the shell, is secured thereto by such means as those now to be described. Herein the shell 6 is provided with a multiplicity of radially extending holes 20 disposed in axial lines, the holes of adjacent lines being staggered, as best seen in the elevation of Fig. 1. Thus, by way of example and without limitation thereto, in the case of a spindle having holes disposed in a zone of the shell forty-three inches in axial length (to accommodate a forty-two inch web), I may provide fourteen rows, as shown in Fig. 3, of holes one inch in diameter, disposed on centers spaced one and a quarter inches in each row and staggered as shown in Fig. 1. Loosely received in the rolls are radially extending cylindrical plugs 22 which may be molded from a suitable plastic and are provided with integral bases 24 at their inner ends within the shell. As best seen at the lower portion of Fig. 1, the provision of these bases retains the plugs and the cylindrical portions thereof, being of greater length than the thickness of the shells 6, permit the ends thereof to be projected outwardly to grip the core 8 as seen in Fig. 3. The outer ends of the cylindrical portions 22 are

preferably curved to the surface of a cylinder, as best seen in Fig. 3. The bases 24, as indicated by the dotted lines in Fig. 1, are oblong and the bases of adjacent plugs present their edges closely together so that the cooperation of the bases of adjacent plugs serves to properly position the same with the projecting portions in proper orientation to dispose the curved dimension thereof in the circumferential direction rather than in the axial direction.

The plugs may be thrust outwardly into engagement with the core 8 by means of an inflatable tube 26 encircling the inner shell and bound thereto at its inner ends by the bands 28. Air under pressure may be supplied through a valve 30, herein shown as disposed in the plug 16 of the inner shell, and finds its way through ports 32 to the interior of the tube 26, permitting the latter to be inflated to the position shown in Figs. 2 and 3. In the deflated position of the tube as shown in Fig. 1, the latter is supported by the inner shell 12 so that, as the plugs recede under gravity, as indicated at the upper portion of Fig. 1, they are supported in such manner as to prevent the cylindrical portions thereof from being displaced from the holes.

It will be understood that the core 8 is slipped on over the spindle when the tube is deflated, as shown in Fig. 1, with the plugs either in the retracted position shown at the top portion of that figure or in the unsupported position shown at the bottom from which they may be easily displaced to permit the edge of the core to pass. When the tube 26 is inflated, the plugs are pressed outwardly, and their multiplicity and the arrangement thereof provides for a uniform pressure against the inner wall of the core 8, supporting the latter and any roll of material thereon in a truly central position and avoiding any distortion of the core. This is of importance in order to provide for a uniform compact winding and for a uniform tension of material dispensed from or led to the core since any distortion of its true cylindrical form or any eccentric or wobbling motion thereof would result in a non-uniform tension on the web and would disturb the proper relation of the elements of a series of operations preformed in sequence on the web. Thus, if the web were being drawn through a perforating mechanism, the perforations would be unevenly spaced.

If the spindle is utilized in connection with a slitter, instead of a single core a number of relatively short cores may be disposed thereon, and in Fig. 2 I have shown one relatively short core

at the left and a portion of another immediately adjacent thereto at the right. The staggered relation of the plugs permits an effective grip to be exerted on cores of even such a small width as to correspond to the axial space between the centers of plugs in two adjacent rows, that is, half the width between centers of successive plugs in a single row.

By regulating the air pressure the grip on the core may be such as to permit slipping of the same under a predetermined tension, as is desirable in some applications.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. A roll spindle comprising a cylindrical shell pierced substantially uniformly around its circumference by axially extending rows of holes, members having radial portions received in the holes and enlarged bases within the shell, an inflatable tube underlying the bases, and means limiting the collapse of the tube to prevent in-

ward displacement of the members from the holes.

2. A roll spindle having an inner tubular shell, means for supplying compressed air thereto, an inflatable tube about the shell, the shell having ports to permit the passage of air to and from the tube, an outer shell enclosing the tube, and a multiplicity of members having radial portions traversing the outer shell in axial rows distributed substantially uniformly around its circumference and enlarged base portions opposing the tube.

3. A roll spindle comprising a shell pierced substantially throughout its roll engaging surface with a multiplicity of holes arranged in closely spaced staggered relation, members having radially extending portions received in the holes, said portions having cylindrically curved outer ends and enlarged asymmetrical bases within the shell having closely opposed edges, and a pneumatic support within the shell contacting the bases.

4. A roll spindle comprising a cylindrical shell pierced substantially throughout its roll engaging surface with a multiplicity of holes arranged in closely spaced staggered relation, plugs loosely received in the holes and a pneumatic support for the plugs within the shell.

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